1940

THE POLAR TIMES

Royal Society Range

The peaks are more than 4,000 m high, less than 40 km from the Antarctic coast. The escarpment on the skyline consists of flat-lying sediments of Devonian to Jurassic age, part of the post-orogenic Beacon Group. Foothills in the foreground are made up of intensely folded marble, schist and gneiss of Cambrian and, probably, Precambrian age. At bottom is dust-laden ice of the Koettlitz Glacier. (Photo by the U. S. Navy for the U. S. Geological Survey)

GLACIER IN A HURRY: A river of ice about 22 square miles in area is moving down the east flank of Mount Steele, on the Alaska-Canada border. This photo of scene was made by Arctic Institute of North America. Walter A. Wood, president of American Geographical Society, said glacier was moving at rate of about two feet an hour.

NORTHERNMOST CELEBRATION—The Rutgers flag is draped over stone cairn constructed in Arctic in honor of Rutgers' Bicentennial. Flanking the carin are Grant Walton at left and Dr. John Tedrow at right.

Aug. 21

What may have been the northernmost observance of the Rutgers Bicentennial was held last month in the northwest corner of Greenland, just 660 miles from the North Pole.

In the polar desert of Inglefield Land, two Rutgers soil scientists and a civilian geologist for the Army built a cairn out of flat rocks in honor of Rutgers' 200 years. Up there, where the wind rarely stops blowing, they had only coffee with which to toast the occasion.

Dr. John C.F. Tedrow, professor of soils at Rutgers College of Agriculture and Environmental Science, and Grant F. Walton, instructor at the college, left a note in a bottle within the cairn announcing that it was "built to commemorate Rutgers University's 200th year of teaching and research."

The Polar Times

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No. 63. DECEMBER 1966.

Plan for a New Assault on Antarctica

By WALTER SULLIVAN

The New York Times

Sept. 24

One of the most ambitious exploratory efforts ever undertaken is in preparation. By means of a leapfrog technique with helicopters, motor toboggans and ski-equipped transport planes it is hoped that the mountains fringing 1,300 miles of Antarctic coastline can be surveyed and studied in a three-month period beginning in November. The operations will be conducted from bases to be established, successively, at three points along the coast of Byrd Land.

Last week about 200 of those who will conduct or supervise American research in Antarctica during the coming summer there (which coincides with the northern winter) assembled at Skyland, on the Skyline Drive in Virginia, for briefings and consultations. The first planeload is to fly to Antarctica from New Zealand about Oct. 1.

The farflung program, in addition to the Byrd Land operations, includes an effort to determine whether Africa, South America and Antarctica, now far apart, were once part of the same continent. This will be done by seeking out the fossils of certain shellfish. Penguins will be captured to study how they navigate by the sun, how they keep warm in that frigid climate and how their body chemistry has adjusted to extreme cold. Two dozen penguin eggs will be rushed to California in a special incubator to be hatched under laboratory conditions.

Dr. Wernher von Braun and others from the National Aeronautics and Space Administration are to study an ice-free region near McMurdo Sound to see if it is suitable for testing vehicles and other equipment slated for landing on the moon and Mars. In the same desert-like area, the mummies of seals 1,200 years old are to be collected to see if, in 12 centuries, seal body chemistry has evolved in subtle ways. The proteins and nucleic acids in the mummies will be compared to those of present-day seals.

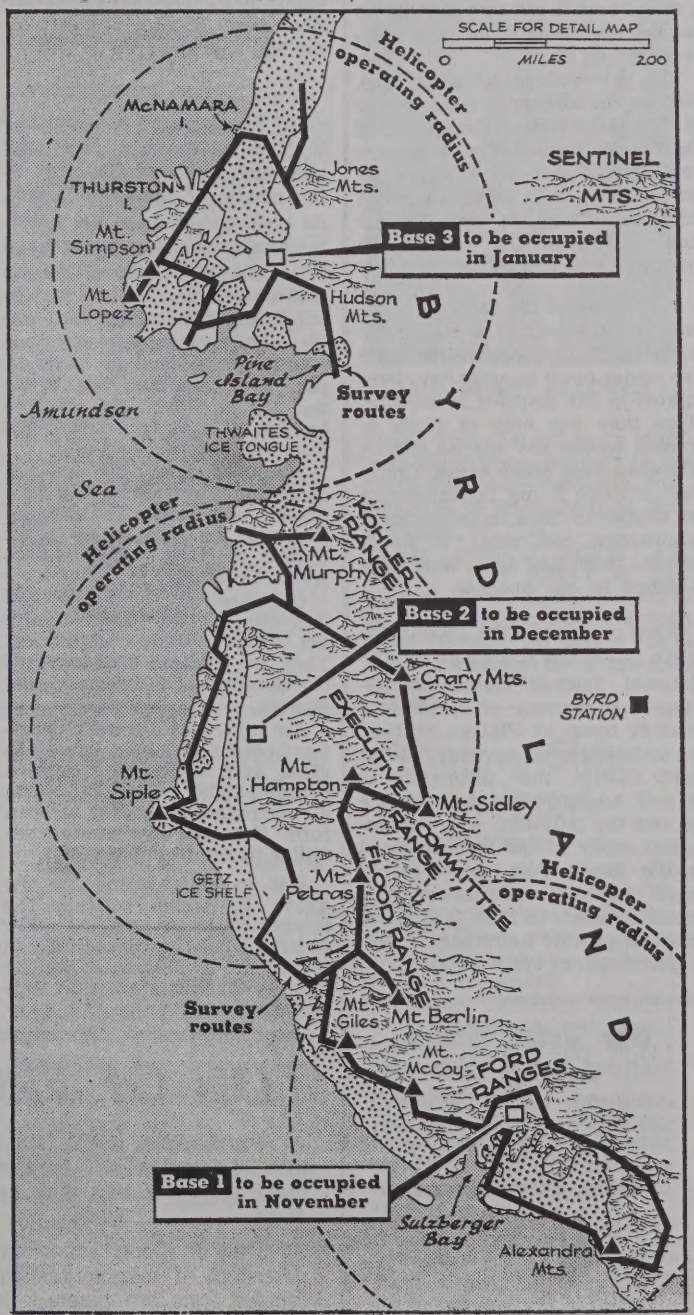
In the Byrd Land operations survey lines some 1,500 miles in length will be laid out, using electronic distance measuring devices. Precise positions of peaks and other landmarks will be established so that maps can be made from aerial photographs. Operations in November will be based in the Ford Range, where the United States Antarctic Service had a field base in 1941.

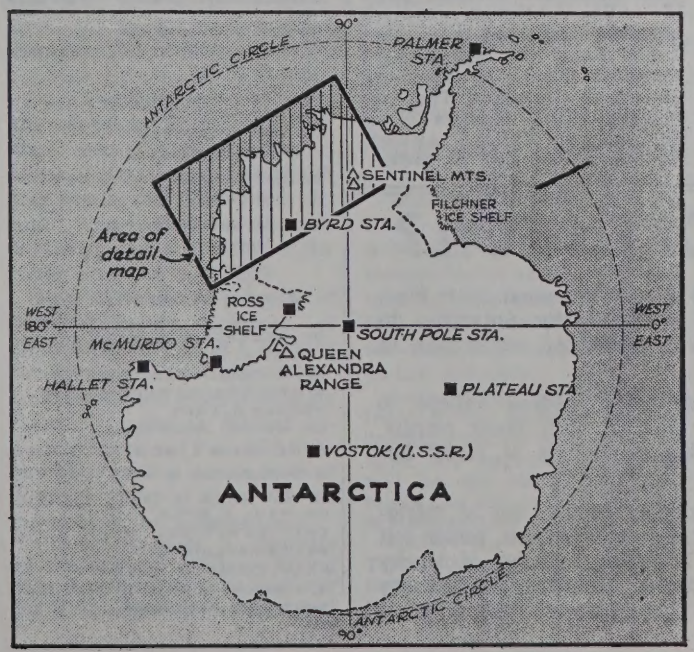
The base will consist of three collapsible Jamesway huts and various tents. Army helicopters will lift the field parties from site to site and they will chug up icy slopes in motor toboggans.

Gravity readings and radar measurements of ice thickness will be made at a great many points. A half ton of gear will be flown to ten sites to confirm radar depth measurements by explosion soundings

Plants will be collected from the rugged outcrops of rock and gravel. Overhead aircraft will be flying back and forth along grid lines, carrying magnetic equipment to survey the entire region. The 5,000 miles of projected flight lines should indicate, without the need for one stroke of a geologist's hammer, which mountain ranges are volcanic in origin and which are composed of sedimentary rock.

The first half of the season Dr. F. Alton Wade of Texas Technological College, a veteran of the early Byrd expeditions, will be in charge of this work. Dr. J. Campbell Craddock of the University of Minnesota will take over for the remainder of the season. A Soviet





A three-month study of 1,500 miles of Antarctic terrain will range from magnetic survey of mountain ranges to new type radar probe of land contours beneath ice. Top map shows the three bases from which these studies will be carried out. Other focal points of U.S. effort include Sentinel Mountains, whose shellfish may show whether Africa, South America and Antarctica were once a single supercontinent.

geologist, Dr. Lev Klimov, will take part under the exchange program with the Soviet Antarctic expedition.

The search for sites sufficiently like Mars or the moon for testing purposes will be conducted in the dry valleys west of McMurdo Sound. Among the items that will need testing under conditions as much as possible like those of the moon is a drill that can extract rock samples from depths as great as 100 feet. Another is a vehicle designed to roam the lunar surface. The Jet Propulsion Laboratory in Pasadena is interested in finding a spot where it can test in realistic manner the life-detection devices to be landed on Mars.

The dry valleys of Antarctica may be the answer, although they are probably wetter than most of the Martian surface. The valleys are kept free of snow by the arid climate and by high winds funnelled into them. They are protected, by mountains, from the flow of the great ice sheet toward the sea.

A new test of the theory of continental drift will be a search for conchostracans — mussel-like shellfish whose fossil remains have been sighted in the Sentinel Mountains. Since they live only in fresh or brakish water, the species cannot migrate across ocean areas. Therefore, if those found in Antarctica are similar to those in the rocks of neighboring continents, it would indicate these land areas were once attached to one another.

Other projects in the 7.6-million-dollar Antarctic program of the National Science Foundation include the erection of a 102-foot weather tower at Plateau Station, the installation of an Army drill at Byrd Station that ultimately is to drill an 8,000-foot hole in the ice and the initiation of a psychological study of the men confined to the South Pole camp during more than five months of perpetual darkness in 1967. It is hoped this will provide knowledge useful in planning long space missions.

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each.

MIRAGES DECEIVE ANIMALS AND MEN

No Product of Imagination, They Fool Even Cameras

WASHINGTON — Lakes, imaginary islands, and ghost riders in the sky are some of the props in nature's bag of tricks—the mirage.

This optical phenomenon has hoodwinked mankind for centuries. Even wildlife is deceived, the National Geographic Society says.

A longtime American explorer in Mongolia was astonished to find a beautiful blue lake swarming with exotic birds in the middle of the Gobi Desert. As he hurried toward the water, the creatures changed shape and fled; the lake paled into an arid waste.

In 1958, the Italian Navy announced the discovery of a new Mediterranean island. Later, a patrol boat sent to investigate the fog-shrouded isle reported to officials that it had vanished into thin air.

Flocks of ducks have swooped down for a refreshing dip in a desert lake only to stir up clouds of dust. Cattle are never fooled, however — they locate water by smell.

Contrary to widespread belief, mirages are not the product of a feverish imagination. They are optical illusions that can deceive even the impersonal camera.

Air layers of different densities create mirages. Just as glass and water can bend a beam of light, a "lens" of warm air surrounded by cold air can form the roadway mirage familiar to summer motorists.

Hot asphalt warms the air above it, which reflects the images of trees, cars, or other objects where the motorist can see them. A breeze in the air layer can create ripples suggesting waves.

Mirages aren't limited to hot, dry regions, however. More complex conditions involving air "lenses" higher in the sky can produce mysterious visions in cold climates. Images have been projected hundreds of miles across the earth. Small objects have appeared immense.

Residents of Whitehorse, in the Yukon, blinked in amazement one morning when a strange new mountain range loomed just a few miles away. The mountains eventually disappeared as quietly as they had come.

In 1913, a polar expedition headed by Donald MacMillan set out to explore Crocker Land, which had been discovered by Adm. Robert E. Peary during a previous Arctic voyage. The puzzled Mr. MacMillan couldn't find the region in the place indicated by Admiral Peary's charts.

Finally, the expedition saw Crocker Land's "maginificent peaks" far to the west of the charted location. All day the excited men hiked to the scene. When the sun set, so did the mountains. Low hills and desolate ice stretched to the horizon. city is sometimes seen.

Scientist With Appendicitis Evacuated From Antarctic

AUCKLAND, New Zealand, Sept. 13 (AP)—A United States Navy Hercules transport equipped with skis landed at storm-whipped Byrd Station in the Antarctic today and took aboard an American scientist with acute appendicitis.

The condition of the scientist, Armand L. Spitz, 27 years old, of Fairfax, Va., was described as not critical. But the station requested his evacuation because of fears that his condition might deteriorate.

12 Fliers' Bodies on Glacier

REYKJAVIK, Iceland, Sept. 16 (AP)—A British research expedition reported today that it had found the bodies of 12 American airmen on Kronborg Glacier, in Greenland. They are believed to be from a Navy Neptune from Keflavik Airport, Iceland, lost on Jan. 12, 1962.

Esmonde O'Brien, Served On Byrd Trip to Antarctica

Oct. 2

Esmonde M. O'Brien, an engineer on the square-rigged vessel City of New York during Comdr. Richard E. Byrd's expedition to the Antarctic from 1928 to 1930, died Tuesday in Veterans Hospital. He was 75 years old and lived at 1824 Weeks Avenue, the Bronx.

Mr. O'Brien, a veteran of World War I, later was chief engineer of the New York City fireboat, New Yorker. During the Byrd expedition, he was present when equipment was landed on the ice at Little America.

Surviving are a brother, Richard and a sister, Miss Genevieve O'Brien, both of the Bronx.

J. DUFF REED

Arlington, Va., July 11 (AP)—J. (Jonathan) Duff Reed, 73, an explorer who accompanied Adm. Richard E. Byrd on his 1926 expedition to the North Pole, died at his home today of a heart ailment. In 1926 Reed left his office in New York, hung up an "out to lunch" sign and took off with Byrd. Reed navigated the expedition's ship, a sailing vessel named the Chantier, across the Atlantic to Spitzbergen, Norway.

A native of Louisville, Ky., Reed attended the Naval Academy. During World War I he was a first lieutenant with the U. S. 1st Division in France.

Converts 12,500 Eskimos

London, Oct. 4 (Reuters)—Dr. Donald Marsh, Anglican Bishop of the Arctic, claimed today 100% conversion to Christianity of the 12,500 Eskimos in his diocese, the world's largest in area.

TON OF FROZEN SOIL?

PASADENA, Calif., Nov. 15 (AP) — A three-man team from the Jet Propulsion Laboratory is leaving for Antarctica to make soil tests that may help in unmanned exploration of Mars.

They'll check soil samples from ice-free valleys to determine if micro-organisms exist in such bleak terrain. Similar tests are planned during exploration of Mars' forbidding surface.

Making the trip — and bringing back a ton of refrigerated soil with them — are Dr. Roy E. Cameron, senior soil scientist, of Pasadena; Gerald B. Blank, scientist, of nearby Altadena, and Howard P. Conrow, technician, of nearby La Canada.

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Balchen Receives Polar Society Scroll

Nov. 29

Thirty-seven years ago today Col. Bernt Balchen of Chappaqua, 159 Campfire Road, piloted the Ford trimotor plane "Floyd Bennet" on the first flight ever made over the South Pole.

Tonight Col. Balchen is to receive an illuminated scroll from the American Polar Society "in recognition of his contribution to polar exploration."

The presentation will be made by Walter Sullivan, science editor of the New York Times and member of the society's board of governors, at a dinner to be held in New York City.

Col. Balchen was a pilot for Capt. Roald Amundsen at Spitzbergen in 1925-26. He was also chief pilot for the Ellsworth Antarctic Expeditions in 1933-35. He built air base Bluie West eight on Greenland and was its commanding officer in 1941-43.

He was credited with the rescue on July 6, 1942 of 13 crew members of a Flying Fortress down on the bleak and treacherous ice cap of interior Greenland.

Two weeks later he helped rescue injured Col. Robert W.C. Wimsatt of Washington, D.C. and his sergeant who made a forced landing on the edge of the Greenland ice cap.

Col. Balchen was aboard the Flying Tiger Jet 707 on its 27,000 mile flight from Honolulu to the North Pole, over the South Pole, and back to Honolulu from Nov. 14 to Nov. 17, 1965.

Rear Admiral Robert A.J. English, USN (Ret.) of San Gabriel, Calif., signed the scroll as president of the American Polar Society. He was a member of the second Byrd Antarctic Expedition of 1933-35.

COL. BERNT BALCHEN

Audrey Schipper Is Married Here To Bernt Balchen

Executive of Fairchild Publications Wed to Flier and Explorer

Dec. 1

Miss Audrey C. Schipper and Col. Bernt Balchen, U.S.A.F., retired, the aviator and explorer, were married yesterday evening.

Judge Charles E. Ramsgate of the Family Court performed the ceremony at the home of Col. Maxwell A. Kriendler, U.S.A.F., retired. A reception was held at the Lotos Club. Mr. and Mrs. Walter Fluegel, brother-in-law and sister of the bride, attended the couple.

Mrs. Balchen, the daugher of Mrs. Bronsveld Schipper of Chappaqua, N.Y., and J. Edward Schipper of Lake Orion, Mich., was graduated from Columbia University. She is market research director of Fairchild Publications and a descendant of William Paca, a signer of the Declaration of Independence.

Colonel Balchen, a graduate of the Norway Military Flying School, served as pilot engineer for Roald Amundsen, as pilot of Adm. Richard E. Byrd's plane "America" across the Atlantic in 1927 and as chief pilot of the admiral's Antarctic expedition from 1928 to 1930. He became a United States citizen in 1931.

Colonel Balchen took part in air strikes against the Germans in Scandinavia during World War II and later commanded Arctic search and rescue operations at Fort Richardson, Alaska. He holds awards from many countries. Colonel Balchen is a consultant on engineering, planning and programing with the General Dynamics Corporation in New York. His two previous marriages ended in divorce.

The couple will live in Chappaqua.

Conservation Move Urged By Antarctic Treaty Lands

SANTIAGO, Chile, Nov. 18 (AP)—Representatives of 11 Antarctic Treaty nations recommended today, after a two-week meeting, the establishment of 15 protected areas for the conservation of animals and plants in the Antarctic.

Conservation was a major topic of the meeting, and the recommendation said that "the hunt and capture of animals will be the object of severe regulation and wide interchange of information."

Under the 1959 Antarctic Treaty, nations conducting scientific research agreed to share their findings.

Pole of Inaccessibility Is Goal Of Soviet Antarctic Party

MOSCOW, Dec. 30 (Reuters)—A party of Soviet explorers has begun a 1,900-mile trek across Antarctica that is expected to take them through the Pole of Inaccessibility, probably the most isolated spot on earth, Tass, the Soviet press agency, said today.

Tass said the party with a tractor and sled train, expected to cross places never visited before in its two-and-a-half-month trip. It set off from the Soviet Molodezhnaya Station and will finish at the Novolazareskaya Station.

When an American expedition reached the Pole of Inaccessibility, the point of the frozen continent farthest from any coast, in February last year it found that a previous Russian expedition had left a fully-stocked hut for it.

Whaling Ship A Landmark

WASHINGTON, Nov. 5 (UPI).—The 125-year-old whaling ship Charles W. Morgan, now berthed at the Mystic, Conn., seaport, today was designated as a national historic landmark.

Interior Secretary Stewart L. Udall described the boat as "the world's only extant 19th century whaling vessel, a unique inheritance from the era of the American whaling industry." It entered service in 1841 and made its final commercial voyage in 1920-21.

Igloo's Tunnel Is Useful

The tunnel entrance to an Eskimo's igloo has several purposes: it serves as a vestibule where loose snow may be brushed off; it keeps snow and wind from blowing in; and it provides a sleeping place for the dogs, The Associated Press reports.

U.S. Banishes Ladies From Antarctic Map—Almost

By WALTER SULLIVAN

An Edith, a Grace, a Marie and other "ladies" whose names have brought a touch of femininity to the harsh Antarctic landscape have been banished from that continent at the bottom of the world.

In the interest of brevity such names as Edith Ronne Land, Mount Grace McKinley and Marie Byrd Land have been shortened, depriving them of gender.

Such features were named to honor the wives of men who discovered or explored them. Marie Byrd Land, named for the wife of the explorer Rear Adm. Richard E. Byrd—which is one of the major subdivisions of Antarctica, embracing a region comparable in size to Alaska—is now simply Byrd Land.

Edith Ronne was the wife of Capt. Finn Ronne, an Antarctic explorer. Grace McKinley was the wife of Ashley C. McKinley, third in command of Byrd's first Antarctic expedition in 1929.

The same rule of brevity has been applied to features honoring men.

The result has led to a certain ambiguity. Thus the Lowell Thomas Mountains have become the Thomas Mountains, sharing the map of the South Polar Region with Cape Thomas, Point Thomas, and Thomas Island.

All were named for different contributors to Antarctic exploration. For example, the Thomas Mountains were named by Captain Ronne for Lowell Thomas, the traveler and radio commentator.

The same ambiguity has descended upon the Edsel Ford Ranges, named by Admiral Byrd for the automobile manufacturer who helped back his expeditions. They are now the Ford Ranges.

The United States Board on Geographic Names, which is in the Department of the Interior, has been confronted with a proliferation of feminine designations for Antarctic features. In particular, during Admiral Byrd's explorations prior to World War II, it was customary to name features for wives.

Cynics pointed out that it was improper for a man to name something for himself, but quite appropriate to honor his wife. There was, however, more to it than that. Wives assume a special place in the spirits of those isolated for 14 months or more in that frosty region.

In shortening the names, the board has sought at least to limit the duplication.

A special problem, in that respect, was Mount Ruth Black, named for the deceased wife of Capt. Richard B. Black, a leading participant in the Byrd expeditions. Here femininity triumphed.

The New York Times Dec. 13, 1966

Some place names in Antarctic have been shortened by a U.S. agency. Deleted portions are shown in parentheses.

Because black features are a striking aspect of the Antarctica landscape, that continent teems with places so named. There are two Black Heads, two Black Islands, two Black Points, two Black Ridges and countless Black Rocks. Hence the name of Mount Ruth Black was shortened to Mount Ruth.

Ruth is not alone among the remaining feminine features. The revised names include Lady Newnes Bay (formerly Lady Newnes Ice Shelf), named for the wife of Sir George Newnes, the financial backer of a British expedition in 1898.

Another lady of the landscape is Mount Iphigene, named for the wife of Arthur Hays Sulzberger, chairman of the board of The New York Times, which helped support Admiral Byrd.

Nearby is a feature that was named by Admiral Byrd for three girls and a boy — the Sulzberger children — Marian, Ruth, Judy and Punch. The last is a nickname for Arthur Ochs Sulzberger, now publisher of The Times. The four names were combined into one: Marujupu Peak.

Two major ice shelves—floating aprons of ice that form extensions of the continental ice sheet—have been renamed,

One lies in an area that had been named Edith Ronne Land for the wife of Captain Ronne, one of the only two woman known to have spent a winter in Antarctica. The region has since been renamed Ronne Ice Shelf. The other woman was Mrs. Harry Darlington, wife of Captain Ronne's aviator.

Likewise, exploration has disclosed a large apron of ice covering the southern end of Sulzberger Bay, which was named for Arthurs Hays. It has been designated Sulzberger Ice Shelf.

Most of the name changes have been made quietly in recent months.

While the name changes have distressed some of those involved, the Board on Geographic Names has felt that sooner or later the long names would be shortened.

Usage is the ultimate test of a name's validity, a case in point being the way New Yorkers have clung to the term Sixth Avenue, rather than Avenue of the Americas.

The view of the board has been that, if the longer names are doomed so far as usage is concerned, they might as well be shortened now.

Polar Sleep Study Set

OKLAHOMA CITY (AP) — A group of scientists who have been studying sleep are en route today toward the South Pole to investigate why some people snooze excessively in that frigid area while others get the "big eye."

The scientists will observe Navy personnel and other persons at the South Pole station, a scientific base at the exact geographic pole.

Dr. Jay T. Shurley, research professor of psychiatry, is head of the University of Oklahoma medical center team.

The team has an $87,500 National Science Foundation grant.

Sleep disturbances are common to people who have stayed at the South Pole station, a spokesman explained.

He said some suffer the "big ee" or "long eye"—slang for polar insomnia—and others go to the other extreme and sleep excessively.

Antarctic Under Ice For Ages

WASHINGTON — The Great Antarctic Continent, the bottom of the world, has been buried under ice for at least 11 million years.

This is the conclusion of Dr. Orville L. Bandy of the University of Southern California, cited in the National Science Foundation's Antarctic Journal.

Use of the continent as a unique laboratory for biological studies is stressed in the same report by Dr. Takashi Hoshizaki of the University of California. He talks of transporting such organisms as bread mould, bean plants, fruit flies, and cockroaches to the South Pole to test the hypothesis that organisms maintain their daily rhythms through subconscious detection of geophysical changes in the Earth's rotation. At the pole, there would be no such rotation.

Commander to Be Honored

CHRISTCHURCH, New Zealand, Aug. 2 (Reuters) — A glacier in the Antarctic will be named for the retiring commander of the United States Navy base here, Comdr. W. H. Withrow, it was announced during change of command ceremonies today as Commander Withrow was succeeded by Comdr. R. M. Johnson.

Research goal: saving Antarctic

The Christian Science Monitor

The care and regulation of fur-bearing seals, hard-working penguins, and careless tourists were among the main topics of discussion at the fourth consultative meeting of the Antarctic Treaty.

The ambassadorial-level meeting was attended by delegates from the 12 nations that signed the Antarctic Treaty in 1959, pledging to continue scientific cooperation begun during the International Geophysical Year (1957-58).

Unlike many diplomatic meetings, the Antarctic conference developed great candidness among the delegates and little politics for home consumption. The press was barred from the working sessions that made up most of the two-week meeting, and even discreet leaks were hard to come by.

Researchers and diplomats worked together on the problem of preserving Antarctica as the one corner of the world where nature has not been spoiled by man and where ideological conflicts have had little effect.

Delegates worked with diplomatic finesse and scientific rigor, even in small details such as the difficult translations into each of the treaty's four languages and the conflicts over the names of disputed areas in the Antarctic.

One visitor who is becoming less and less rare in Antarctica, delegates noted, is the tourist. More curious than the penguins and sometimes more destructive than a Husky puppy, the camera-draped travelers often upset the routine of geophysicists and naturalists.

Conservation was the most important topic of the meeting, and the future of the seals the most difficult problem.

Because the Antarctic Treaty does not cover activities on the high seas, naturalists were concerned about how to regulate the hunting of seals that live on floating ice fields near Antarctica.

There has been little hunting in the area since the seals were almost wiped out in the 1870's. But fashions change quickly, and there have been a few reconnaissance expeditions in the area by northern sealers.

Although recommendations to the governments are yet to be published, reliable sources indicate that the solution of the problem is in the adoption of "interim guidelines." These, it is hoped, will be a sufficiently strong form of diplomatic pressure to limit future sealing.

And in the future the governments may work out an agreement on sealing outside the framework of the treaty, which covers only the land area south of the 60th parallel south.

Two species of seals—the fur seals and the Ross seals—also were declared the first "specially protected species" in Antarctica under conservation measures adopted at the last treaty meeting.

Under this recommendation permits for hunting these two species may be issued only for "compelling" reasons, and precautions must be taken not to jeopardize their ecology or survival.

In addition, 15 small regions in Antarctica were set aside as "specially protected areas" which no vehicles may enter and in which no plants may be picked.

These areas include habitats and breeding areas of the Emperor penguins, largest and probably hardest-working of the Antarctic fauna.

9 INSPECTORS NAMED FOR ANTARCTIC PACT

WASHINGTON, Dec. 23 (AP)—The State Department announced today the appointment of nine new Antarctic observers to carry out United States inspections under the Antarctic Treaty.

The nine specialists replace those named in 1963 after the treaty first came into effect.

Under the treaty to preserve the subcontinent for peaceful purposes, the treaty members may inspect each other's bases.

In 1964 the United States observers checked Antarctic stations of six nations, including those of the Soviet Union. Other treaty members, except for the Russians, have made periodic inspections too. No violations have been reported.

In announcing the new United States observer team, a State Department spokesman said the 12 treaty powers had been observing the treaty provisions in "an outstanding example of cooperation in international affairs."

The new observers are:

MERTON E. DAVIES, an electronics specialist with the Rand Corporation.

ERNEST F. DUKES, a research officer in the Arms Control and Disarmament Agency.

RICHARD P. GINGLAND, also with the Arms Control and Disarmament Agency.

KARL W. KENYON, a wildlife biologist with the United States Fish and Wildlife Service.

CYRIL MUROMCEW, a scientist with the State Department.

CARL J. SINDERMANN, director of a biological laboratory in Maryland.

FRANK G. SISCO, an East European specialist in the State Department.

MALCOLM TOON, head of the State Department's Soviet desk.

ARTHUR I. WORTZEL, an East-West cultural exchange officer with the State Department.

Biscuit Tasty After 54 Years

PERTH, Australia (UPI)—A biscuit left by Robert Scott in the Antarctic 54 years ago still "tasted fresh" when sampled by an expedition that went to the old camp in the summer of 1966. Charles Gunn, a geophysicist from Hattiesburg, Miss., said here that the base camp had been found "just as it was left by Scott," who died in 1912.

Whales Begin Annual Swim

LA JOLLA, Calif., Dec. 10 (AP) — Big whales from the Arctic have begun their annual 5,000-mile swim to find romance in the warm gulf waters off Baja California. The first of several hundred migrating whales have been spotted splashing off La Jolla and nearby Ocean Beach. After bearing their young in the gulf lagoons, they will return to the frigid Arctic waters.

SEA OTTERS GAIN IN FIGHT FOR LIFE

Once Near Extinction, They Are Gradually Increasing

SAN FRANCISCO (UPI) — The sea otter, a fascinating creature with stubby ears and long cat-whiskers whose fur was once valued above ermine and mink, is apparently going to win its battle for survival after 150 years of near extinction.

"We are pleased that this very interesting and important animal is gradually increasing again," Dr. Robert T. Orr of the California Academy of Science declared recently.

The California Fish and Game Department counted 591 otters in this year's census. The figure is only approximate because the count has to be made from an airplane skimming over the offshore waves along the California coast. But it is 94 higher than last year.

"No one likes to see any animal become extinct," said Dr. Orr, "and this one is particularly fascinating because of his unique way of life and the part he played in history."

The sea otter's soft, black fur was once so highly valued that a single pelt brought $2,500 on the London market. You can't buy it now. The penalty for killing an otter is a year in prison and $1,000 fine.

The hunt for this fur almost made California a Russian possession in the early 19th century. In 1809, Ivan Alexsandrovich Kuskov sailed home with 2,350 pelts. They made such a hit with the Russian court that an expedition was sent out to establish a fort on the coast north of San Francisco and claim all the waters north of the Golden Gate for Russia.

However, when greedy hunting made the otters scarce, then impossible to find, the Russians, seeing nothing else of value in California, went home.

A hundred years later, in 1938, a few otters were again reported in California waters. Elated marine biologists watched as the number increased slowly. But then they started to decline again.

Record for McMurdo Plant

WASHINGTON, Oct. 19 (UPI) —The Navy said today that its nuclear power plant at McMurdo Station in the Antarctic had set a record by operating continuously for 3,356 hours. It is the longest operating period recorded for a military nuclear power plant. Since its construction in 1962, the McMurdo plant has produced 24 million kilowatt hours. It also produces heat used in desalting water.

U.S. Team of 10 First to Climb Highest Known Antarctic Peak

Group Ascends 16,860 Feet to Vinson Massif Summit in Ellsworth Mountains

By HAROLD M. SCHMECK Jr.
The New York Times

WASHINGTON, Dec. 21 — A 10-man American expedition has climbed the highest known peak in the Antarctic, the first time such a feat has been achieved, the National Science Foundation was informed today.

All 10 climbers reached the top of the Vinson Massif in the Ellsworth Mountains yesterday, 16,860 feet above sea level. The foundation was informed of the feat by its representatives at McMurdo Sound, where the United States has its main Antarctic base.

The climbers planted on the peak the flags of the 12 nations that were the original signers of the Antarctic Treaty of 1959. There was no indication of how long the climb had taken or how difficult it proved to be.

The expedition was flown to the United States Naval air facility at McMurdo Sound on Dec. 9 from Christchurch, New Zealand. Later, the men flew in a Navy C-130 cargo plane from McMurdo to the foothills of the massif, where a base camp was set up for the assault on the peak.

The distance by air from McMurdo, on the Antarctic coast, to the Vinson Massif is about 1,500 miles across the huge Antaractic ice cap.

The 16,860-foot peak is situated at Lat. 78 degrees 31 minutes S., Long. 85 degrees 40 minutes W. It is near the base of the Great Antarctic Peninsula, formerly called the Palmer Peninsula, which thrusts northward from the main body of Antarctica toward the southernmost tip of South America.

Only one permanently manned base lies near the straight line path from McMurdo Sound to the Vinson Massif. This is Byrd Station, a totally under-snow base situated at about the half-way point of the flight.

It is believed that the plane that carried the expedition probably stopped at Byrd Station to refuel on its return flight.

The expedition is still in the field and is expected to climb the 16,300-foot Mount Tyree as well as other nearby mountains in the Ellsworth range before its return by plane.

The leader of the group is Nicholas Clinch, a 36-year-old lawyer from Los Angeles. His companions include Peter K. Schoening, 39, of Seattle; Eiichi Fukushima, 30, Seattle; Brian S. Marts, 23, Seattle and Estes Park, Colo.; Richard W. Wahlstrom, 36, Edmonds, Wash.

Also, James Barry Corbet, 30, Jackson Hole, Wyo.; Dr. Samuel C. Silverstein, 29, a physician from New York City; Dr. William E. Long, 35, a geologist of Alaska Methodist University, Anchorage; John P. Evans, 27, of the University of Minnesota, and Charles D. Hollister, 30, of Columbia University's Lamont Geological Observatory.

Dr. Long, Mr. Evans and Mr. Hollister are scientists working in the Antarctic with the United States research program sponsored by the National Science Foundation. The other seven are mountain climbers.

The expedition is sponsored by the National Geographic Society and the American Alpine Club and is being coordinated by the National Science Foundation.

In recent years the Antarctic has been the only continent in which the highest known peak had never been scaled.

The flags planted yesterday on Antarctica's highest known point were those of the United States, Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, the Republic of South Africa, Britain and the U.S.S.R.

The New York Times Dec. 22, 1966

Cross marks Vinson Massif.

2 New Yorkers in Team

The American Alpine Club at 130 East 90th Street, said yesterday that both Dr. Silverstein and Mr. Hollister had wide experience in mountain climbing.

Dr Silverstein was awarded an A.B. degree in 1958 at Dartmouth College, and a medical degree in 1963 at the Albert Einstein College of Medicine. He interned at the University of Colorado Medical Center, Denver, in 1963 and 1964.

He has been a mountain climber in this country and Canada for 14 years. In 1962 he was one of six young American Alpinists who scaled the hitherto unconquered southeast spur of Mount McKinley, the 20,320-foot Alaskan mountain that is the highest in North America. He is 29 years old and unmarried.

Mr. Hollister, who is married, has been a mountain climber for nine years. The 30-year-old climber has conquered mountains in North America, as well as the Swiss and French Alps.

He has a B.S. degree from Oregon State University, and is now a doctoral candidate in marine geology at Columbia University's Lamont Geological Observatory at Palisades, N. Y.

Antarctic Peril

Ice Breakups Topping Record

Dec. 18

SCOTT BASE, Antarctica (Reuters)—A possible major breakup of antarctic ice in McMurdo Sound during the present summer season may create new hazards for antarctic expeditions here.

Already there is more open water than usual and most of the remaining ice is only a year old.

The New Zealand scientific station at Scott Base was built 10 years ago and the McMurdo ice shelf fronting the base remained stable with more than 100 feet of ice until the 1964-65 summer.

Then the McMurdo breakup extended farther than usual, easing pressure on the ice in front of Scott Base and allowing huge slabs to drift out to sea from the coast.

Again last summer the breakup followed a similar pattern, and broke further into the permanent ice shelf, exceeding the record noted by Scott's expedition in 1910-11.

The starkly defined ice edge, where the liquid black sea swells against the solid white ice is now at Cape Evans. McMurdo Sound is 40 miles wide there and for a distance along Ross Island, the ice clings to the coast. Then it swings in a great arc across the sound to the Prince Albert Mountains of the Victoria land coast.

In front of Scott Base, the anual sea ice is now only eight feet thick.

On it is an airstrip for supply aircraft arriving from Christchurch, New Zealand, and "highways" across the ice from both McMurdo Station and Scott Base.

Vehicles and bulldozers haul heavy sledges to and from the aircraft. This ice will soon be unsafe, and by early next year it will most likely be open water.

Since no accurate prediction of the breakup is possible, a constant watch has to be kept on the ice. Weaknesses are already showing, and in front of Scott Base seals have pushed up through the ice earlier than usual.

Once this ice is considered unsafe, vehicles will have to go around the dge of Ross Island to an alternate airstrip on the permanet ice shelf.

From other parts of the antarctic continent, other scientific stations report that more sea ice than normal has broken way from coastal areas.

Broken Free

To the north of McMurdo Sound, at the United States Hallett Station, ice has broken free in the bay.

Similar early breakups have occurred at Japan's Showa Station and Australia's Wilkes Station.

On his first antarctic expedition, Scott moored his ship Discovery in winter quarter bay (now the site of the United States McMurdo Station) early in February 1902.

Pram Point, where Scott Base is built, was so named because some of the expedition rowed here in a pram (rowboat).

The following summer, the breakup stopped many miles north of the Discovery anchorage, and, unable to work free, the ship and expedition had to remain another year in Antarctica.

Since men began to occupy McMurdo Sound 10 years ago, the breakup has been creeping farther south each season.

Some theories attribute this to the effect of ice-breakers causing a premature breakup in November, yet the extensive natural breakup recorded in Scott's diary was only slightly exceeded last season.

The New Zealand antarctic division superintendent, R. B. Thomson, decided that some sea rescue equipment should be installed at Scott Base this summer.

Hope to Clear Up Antarctica Mystery

By William J. Perkinson
Long Island Press

Currently, no one is really sure which mountain is truly the highest in Antarctica.

The latest maps issued by both the National Geographic Society and the United States Geological Survey, indicate that Antarctica's two highest mountains lie in what is called the Sentinel Range, one of the least explored of the many snow-free areas that dot the continent.

* * *

THE TWO peaks are called Mount Vinson and Mount Tyree.

Mount Vinson is listed as rising 16,890 feet above sea level. Mount Tyree is listed as rising 16,240 feet above sea level.

The trouble is that no one knows for sure the true heights of either peak.

According to the best available maps of the United States Antarctic Research Program in Washington both peaks rise out of an ice-covered snow plain that itself is "thought to be" some 10,000 feet above sea level.

That means, it is explained by experts, that the mountains themselves rise some 6,000 feet or so above the snow.

Thus, they explain, the teams climbing either of the two mountains would have what is considered a relatively short climb, once they set up their base camps.

* * *

CHIEF HAZARDS of the climb would be the almost unpredictable blizzards and cold that would hit the climbers. Average temperatures on the slopes of the two mountains are estimated to range from 10 degrees above zero in the sun to 35 degrees below zero in shaded areas.

Those temperatures are on the Fahrenheit scale. They indicate that, on the average, the climbers will be working at temperatures from 22 to 57 degrees below the normal freezing point of fresh water.

The reason why there is so much guessing and estimating temperatures, heights and other data about Antarctica is that until very recently there has been very little systematic exploration of the continent surrounding the South Pole. Pole.

Maps published as recently as five years ago, for example, listed what turned out to be a "phantom Mount Vinson" as the highest peak in Antarctica.

That peak was thought to be in Merle Byrd Land, more than 1,000 miles from where the current Mount Vinson is located. The phantom peak was also thought to rise some 16,000 to 18,000 or even 20,000 feet above sea-level.

* * *

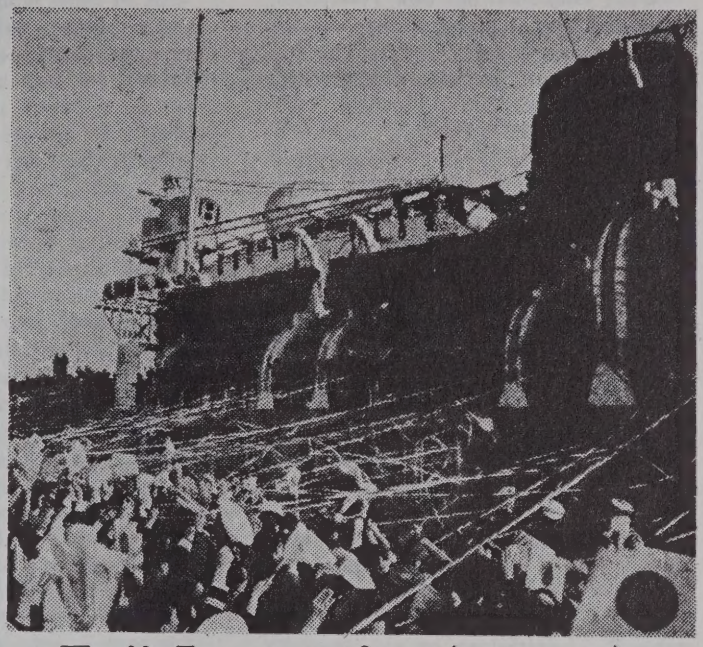
IT IS NOW known — according to the National Geographic Society, the United States Geological Survey and other Antarctic agencies—that no such peak exists in Antarctica. Early Deep Freeze explorers apparently were deceived by the polar mirage called the Fata Morgana.

Thus, the name of the phantom Mount Vinson was transferred to the highest peak in the Sentinel Mountains.

The race to climb the highest peak in Antarctica also has some other curious aspects that involve personal, international and historic rivalries.

The Sentinel Mountains lie in that part of Antarctica that is fairly close to South America, in an area that has been claimed by a number of nations, including Great Britain, Chile, Argentina and even Peru. Geographically, the Sentinels are almost 10,000 miles due south of the Mississippi River Valley.

The Sentinel Mountains themselves, however, were first discovered and skimpily photographed in 1935 by Lincoln Ellsworth and Herbert Hollick-Kenyon on the first dramatic and historic flight across Antarctica.



Fuji Leaves for Antarctic

Dec. 2

Japan's eighth Antarctic observation team left Tokyo Thursday aboard the icebreaker Fuji for the "great white continent."

A ceremony marking the resumption of Japanese Antarctic expedition was held at the Harumi pier, where the Fuji was berthed. Those present included Education Minister Kiichi Arita, chief of the Antarctic research expedition headquarters.

The 7,760-ton icebreaker carried a 40-member party of scientists, headed by Prof. Tetsuya Torii of Chiba Engineering College, and had a crew of 182 under the command of Capt. Mitsutoshi Matsuura.

The expedition is accompanied by five Japanese newsmen.

The Fuji is scheduled to arrive at Fremantle, Australia, Dec. 16.

At the port, an American scientist will embark to join the expedition.

The Fuji will approach the Showa Base on Angul Island, around Jan. 10. Two helicopters will then start the transportation of materials and supplies from the ship to the base, headquarters for the expedition.

The Fuji is scheduled to leave for Tokyo around in mid-February leaving behind 24 members of a wintering team.

The ship will return to Tokyo April 19.

British Antarctic Base

LONDON, Dec. 2 (AP)—Britian is shipping a new seven-hut village to the Antarctic to replace her Halley Bay Station, which was sunk 50 feet below the surface after a decade in the frozen continent. The British Antarctic survey said today the 85,000 - cubic - foot shipment would leave Southampton Tuesday and would contain prefabricated buildings and equipment.

ANTARCTIC TOUR

CANBERRA (AP) — The U.S. ambassador to Australia, Edward Clark, will make a five-day tour of the Antarctic in early December, going via New Zealand to the American South Pole base and Byrd Station.

Von Braun to Visit Antarctic

HUNTSVILLE, Ala., Dec. 21 (AP)—Dr. Wernher Von Braun believes a trip to the South Pole will help get a man on the moon. So, he and three other space scientists will spend two weeks in Antarctica beginning Jan. 2 to observe how men get along in such alien conditions. Dr. Von Braun is director of the Marshall Spaceflight Center.

Jet Lands in Antarctica

CHRISTCHURCH, New Zealand, Nov. 14 (Reuters) — A United States Air Force Lockheed Starlifter today became the first jet aircraft ever to land in Antarctica. The jet landed on a 10,000-foot ice runway near McMurdo Station and then flew back to Christchurch, a 5,000-mile round trip that took 11 hours.

GEOTIMES November 1966

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Geological research in Antarctica

by PHILIP M. SMITH
Office of Antarctic Programs
National Science Foundation
Washington, D. C.

ANTARCTICA HAS MANY natural barriers that hamper the field geologist in his work. The extreme cold at many of the mountains, especially those in the continental interior, limits the length of the field season to something less than 90 days from mid - November to mid - February, when the continual daylight warms the mountains to the 20s and low 30s (F) on calm days. The Antarctic ice cap covers all but about five per cent of the land. Exposed mountains commonly have steep faces and are surrounded by hazardous, crevassed terrain. Distances along some ranges are great but are much less than the distances between the mountains and the permanent year-round stations, which, with four exceptions, are all on the Antarctic coast. It has been and remains a formidable place to live and work. Because of the environmental problems, geological research in Antarctica requires the provision of a variety of facilities and services not normally needed in geological programs supported by the National Science Foundation.

Although some geological research was undertaken on the Byrd expeditions and during the International Geophysical Year, U. S. investigations into Antarctic geology did not begin in earnest until the U. S. Antarctic Research Program was organized in 1959. Since then, through the experience of many field investigators and through continued experimentation with logistic techniques, an effective system of supporting services and equipment has been developed for the Antarctic geologist. Those services and equipment, described briefly here, are available to all geologists contemplating work as a part of the U. S. Antarctic Research Program. They have transformed the working experience of the geologist from an arduous task of limited productivity to a highly profitable program at reasonably comfortable field camps.

The general research objectives in the various sciences and plans for major investigations in the USARP are developed at the Office of Antarctic Programs of the National Science Foundation in consultation with the scientific community. These plans are then studied by the Naval Support Force, Antarctica, which, in continued consultation with the NSF Antarctic Program staff, develops a practical logistic program for the support of all the station and field investigations. Plans for major investigations to 1971 have been reported recently in the *Antarctic journal of the United States*. An example of the long-range planning that is carried out by the Office of Antarctic Programs and the Naval Support Force, Antarctica, is the development of a series of interdisciplinary field studies in the little-explored mountain areas along the Byrd Coast, in Ellsworth Land and south of Princess Martha Coast. Those projects will be carried out between 1967 and 1971. Acquisition of aerial photography for mapping in each specific area will be completed at least a year ahead of actual field work, and geodetic control for production of topographic maps will be acquired concurrently with the geological research, thereby providing a completed map about the same time as the geological results are ready for final publication.

This general planning in no way limits the interests of the investigators. It is a necessary first step to the effective planning for the specific projects, and it assures the availability of the logistic services provided by the Navy, the facilities and services provided by USARP, and the funding itself, which must be obtained annually by NSF and the Department of Defense along with their other appropriations. Within this general frame of reference, proposals for geological research during a given austral summer are received, and, where favorably reviewed, funded between March and May. Then begins a period of more detailed planning by the Office of Antarctic Programs, the Naval Support Force and the individual investigators. The objective is complete preparation for initiation of field work some five months later as the austral summer Sun warms the mountains to temperatures that are practical for field work.

Antarctic research requires aerial or surface transport of all personnel and material from South America, New Zealand or Australia. Use of the optimum working season requires that the field party be flown to Antarctica in October or November, or sent by ship the previous season. Ship operations around Antarctica cannot begin until the ice pack recedes in late December. In the U. S. program, scientists working in Antarctica during the austral summer are flown to the continent immediately before summer begins in order to eliminate an unproductive winter at an Antarctic station. To prevent excessive movement of field equipment by air between the United States and Antarctica, field parties are processed in Christchurch, New Zealand, and at McMurdo Station, the main U. S. Antarctic station. In New Zealand, scientists are equipped with cold-weather clothing for the trip to Antarctica. This clothing is procured for all investigators through an NSF service contract.

At McMurdo Station a large store of field equipment, motorized toboggans and sleds, field rations, radios and other supplies await the geologists. With the arrival of 20 to 25 field parties in October, it is necessary to set aside much of the field equipment needed by each individual party in advance of its arrival. That is possible because of the field sup-

port planning consultations between the Office of Antarctic Programs and the individual investigators during preceding months and the transmission of the anticipated needs to McMurdo by radio. Arriving field parties are met by personnel of the USARP representative's staff who assist them in the preparations for the field work; preparations are normally completed in a few days.

Two orientation programs have been organized to familiarize new investigators with some of the problems of research in Antarctica. Each September all participants in USARP, including those who will spend the winter in Antarctica, assemble for a week-long orientation program at Skyland in Shenandoah National Park. Invited speakers, many of them authorities in their fields and Antarctic veterans, discuss the history of Antarctic research, specific plans for field investigations, the work of the U. S. Navy in support of USARP, environmental problems of working in Antarctica, and survival in emergencies. Group discussions allow different field parties with similar interests to compare notes and discuss their specific projects. A further course of instruction designed specifically for the field parties is held in October at McMurdo. A team of highly trained New Zealand mountaineers holds briefings and practical field sessions on snow and ice safety and crevasse rescue. The course is not intended to make expert polar travelers out of the geologists, but rather to acquaint them with the special problems of Antarctic field work in the hope they will not overextend themselves in the field.

McMurdo Station is the nerve center of USARP during the austral summer. All personnel and supplies for the three U. S. inland stations—Byrd, Plateau, and Pole — pass through McMurdo. The field parties are transported to various nearby and remote locations by aircraft. McMurdo is the principal communication center, and stocks of two million gallons of aviation fuel support the 7,000 hours of flying annually. Though plans are well laid in advance, vagaries of Antarctic weather and occasional changes in the logistic schedule made necessary by equipment problems require further coordination of the individual programs and Navy support. A USARP representative, a member of the Office of Antarctic Programs staff, is at McMurdo Station throughout the austral the available logistic support among the various investigating teams.

The key to geological work in Antarctica is an effective transportation system to span the great distances between the stations and the mountainous areas. Many investigators require only heavy logistic transport to move them and their supplies to a remote field site where they will spend two to three months. Others, especially those working in the ice-free valleys west of McMurdo Sound, are supported best by helicopters. It is in the area of transportation that the unique capabilities of the Naval Support Force, Antarctica, are most fully realized. At any given moment in the course of the austral summer, 8 to 15 geological parties and as many biological teams may be working at 20 to 25 locations in an area as large as the United States. Without the superb capabilities of the Navy's Air Development Squadron Six and the Army's Antarctic Helicopter Detachment, this geographically diverse scientific program would not be possible.

Communication with one of the major Antarctic stations is required of all field parties daily or every second day. Sometimes the radio schedule is burdensome to the field researcher as it may be necessary for him to stop his work in order to make a radio contact. However, the safety and emergency aerial supply capabilities made possible by the regular schedule outweigh disadvantages. Antarctic radio communications are often spotty because of the severe propagation problems in the auroral zone. The field teams today use single-sideband voice transceivers, which are generally dependable.

With modern field equipment, communications, ready aerial transport, and often Jamesway huts as field shelters, the Antarctic geological research program proceeds with considerable efficiency and a fair degree of comfort for the investigators. As research has extended knowledge of Antarctic geology over the years, detailed studies have been added to the general reconnaissance that characterized the work in the early post-IGY period. Some of the current work requires laboratory facilities. To support these projects, an earth sciences laboratory with 960 square ft of floor space has been built at McMurdo. Office space, grinding and rock-cutting equipment and a cold laboratory are available. Additional equipment is being provided to the laboratories as research projects require. As most of the equipment is useful to more than one project, it is procured through an NSF contract for laboratory support. The earth sciences laboratory and the helicopter support provide geologists with opportunities to combine field research in the highly interesting McMurdo area and laboratory work with facilities comparable to some academic institutions. The same service has been available for some years to the biological investigators whose well-equipped laboratory at McMurdo has gained world renown.

Most investigators working in Antarctica bring some samples home by aircraft. However, most specimens (in geology programs often amounting to several tons), are returned by ship. The ship leaves McMurdo at the end of the field season and arrives in the U. S. in late March or early April. The material is then forwarded to the individual campuses and laboratories.

The facilities and services described here make it possible for the academic investigator to undertake a research program without the necessity of attending to all the details of a field project in such a remote area, a task virtually impossible on short notice and with any efficient use of existing aircraft and ship transport techniques. Though some difficulty was experienced in the early years after the IGY, the supporting systems and facilities are effective today. An investigator leaving the U. S. in mid-October can receive cold weather clothing, snow equipment instruction, all his supplies and be in the field in the interior of Antarctica about Nov. 1, perhaps 15 days after he leaves the U. S. That is in sharp contrast to the investigating team aboard the first Byrd expedition ship; their trip to Antarctica took 100 days and a winter was spent awaiting an opportunity to begin field research.

New developments that will further geological research in Antarctica are being studied by the NSF Office of Antarctic Programs and the Naval Support Force, Antarctica. Attention is being given to an airborne geophysical laboratory plane that will probe the still unknown areas of Antarctica, acquiring data that could otherwise be obtained only through laborious travel over the ice cap. Research submersibles are being studied although there are many problems for such vessels in ice-covered seas; they offer great potential for the marine biologist, the glaciologist, and the marine geologist. Winter flights to McMurdo are being planned on a regular basis. Although these flights may not directly support the Antarctic geologist, the airborne laboratory plane and research submersibles offer much for the future.

Blue Whale Has Fighting Chance to Survive

Scientist Hails Ban on Pursuit of Last 600 of Species

By WALTER SULLIVAN
The New York Times

WASHINGTON, Dec. 29—It appears that the blue whale, largest creature that has ever moved across the face of the earth, has a fighting chance of being saved from extinction.

This was the gist of a report presented here today by a leading expert on the problem.

In the nineteen-thirties, an average of about 14,500 of these giants, some of them 100 feet long and from 125 to 150 tons in weight, were harpooned annually by newly, built catchers fast enough to overtake them. Today, an estimated total of 600 are left in the vast ocean surrounding Antarctica.

However, this year, for the first time, a total ban on their pursuit has been agreed to by the nations that take part in Antartic whaling — now reduced to Norway, Japan and the Soviet Union.

The result, according to Dr. Douglas G. Chapman of the University of Washington, is that the blue whale may yet survive as a species.

Dr. Chapman, served as the American representative on the international committee of specialists that recommended the current ban. He spoke at the Shoreham Hotel at a symposium on over-exploited animals. The panel was part of the annual meeting of the American Association for the Advancement of Science. He elaborated on his views in an interview.

The difficulty in making a firm prediction that the blue whale will survive is the lack of knowledge concerning its breeding habits.

With only 600 of the giant animals in the world ocean, how difficult is it for boy to meet girl, so to speak?

Dr. Chapman believes they will manage. The blue whale appears to be monogamous. However, observations in recent years suggest that small groups of them congregate in certain patches of sub-tropical water during the breeding season.

Like many other polar animals, the blue whales migrate to food-rich polar waters in summer, then retreat to warmer latitudes in winter for breeding. Little is known of their breeding behavior because tney remain far at sea.

The seasons in the Northern and Southern Hemispheres are reversed. Hence, the blue whales of the north are feeding in icy waters when those of the south are breeding in the subtropics and the two varieties apparently never meet. The northern blue whale is even more rare than his southern cousin.

Dr. Chapman said that, ironically, if the whaling nations had agreed to a sharp cutback in the blue whale harvest in 1950, when the annual catch ran above 6,000, no cutoff would have been necessary.

For many years the whaling nations, through the International Whaling Commission, have agreed—or sought to agree —on annual quotas for the Antarctic whale catch.

The quotas traditionally have been in "blue whale units," which are designed to give whalers some flexibility in their catch. Two whales or six sei whales equal one blue whale unit.

Observers from the government of the nation whose flag is flown by each factory ship ride the ship and report the catch. Two fin whales or six sei reaches the agreed limit, all are told by radio to go home.

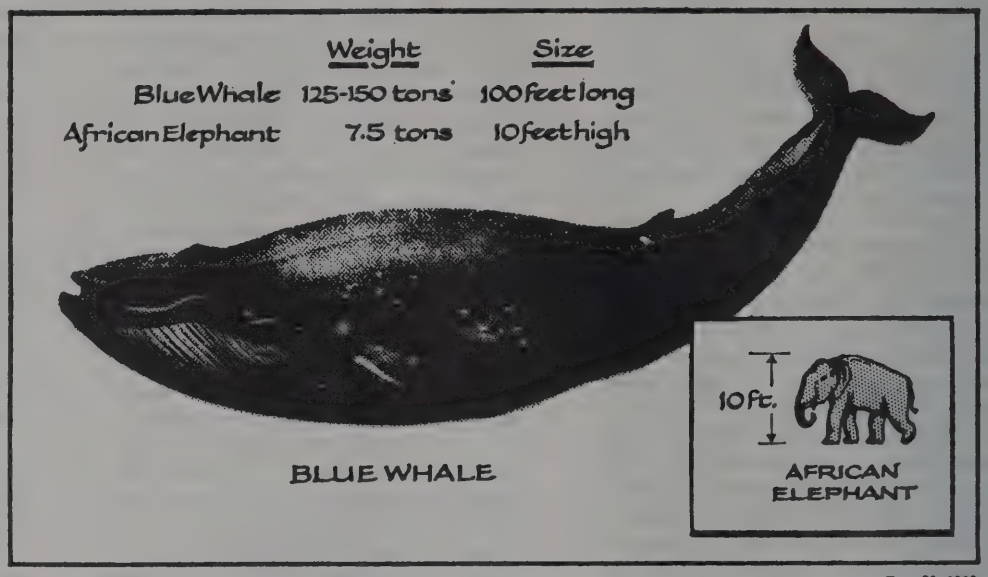
In the current Antarctic season, which began this month, a record low quota of 3,500 blue whale units has been agreed to, but no blue whales can be taken.

Last year a small area was open for blue whale hunting. None were taken there, but one was taken, illegally, as reported by one of the national observers.

Last year, the Antarctic catch was 2,314 fin whales and 17,558 sei whales. The latter, although low in whale oil, have increased in value because their meat has become popular, particularly in Japan. Dr. Chapman expressed concern for both these species.

He noted that there had been a dramatic decline in whaling. Until a few years ago, the whaling fleet in Antartica included 22 factory ships for processing the catch, each with its fleet of catchers. This year, there are four or five.

However, he believes a small whaling harvest can be continued until the whaling population recovers its former abundance.



The New York Times Dec. 30, 1966

Next to gigantic blue whale (which is drawn to scale above) elephant is a small creature

WHALES REDUCED BY NEW WEAPONS

Blue Whales Almost Extinct —Catch Limits Are Cut

WASHINGTON — Even the finback, fastest of all whales, cannot swim fast enough to elude a modern harpoon gun. The most plentiful of the large whales, the finback is the mainstay of today's whaling industry, the National Geographic Society says. More than 630,000 have been killed in this century alone.

Modern hunters with factory ships, helicopter spotters, and explosive harpoons have taken a deadly toll of finbacks and other species hunted in Antarctic waters. The blue whale is almost extinct; the humpback and sei whales have been greatly reduced.

In the past, major whaling nations have agreed to limit the catches and kinds of whales taken. In spite of quotas, the number of whales has declined alarmingly.

The International Whaling Commission recently set the catch for the 1966-67 season at 3,500 "blue whale units," compared with 14,500 units 10 years ago.

Though blue whales are rarely seen, catch limits still are expressed in terms of this species. One blue whale equals two fin, two and a half humpback or six sei whales.

The blue whale is the largest animal that ever lived on earth. It may reach 100 feet in length and weigh 150 tons. Its bulk equals 35 elephants. Its weight is twice that attained by the largest dinosaurs.

The finback whale, beautifully streamlined, speeds through the sea at 30 miles an hour. The 50 to 70-ton creatures possess great power. One towed a whaling vessel for three hours at 12 miles an hour, even though the ship's engine was churning away at three-fourths speed astern.

Humpback whales like to hurl their entire 50-foot bodies out of water and land on their sides with a bone-jarring splash. To attract females, amorous bull humpbacks stand head down in the sea and beat the surface to a froth with their mighty flukes.

The whaling commission has forbidden taking humpbacks and blue whales in the North Pacific.

Writing in the National Geographic Society book, "Wild Animals of North America," the noted mammalogist A. Remington Kellogg said, "Whales once roamed the oceans of the world in millions, but today they may be nearing the same fate that doomed vast herds of bison."

Antarctica's Weddell seals search for food as deep as 1,500 feet below the surface, the National Geographic says.

Olaf, the Walrus, Is Dead at 10; Long a Favorite at Aquarium

Dec. 15

Olaf the Walrus, who often twisted his bristling mustache and gave a warm smile of greeting for visitors calling him by name, died of unknown causes yesterday at his home for the last nine years, the New York Aquarium at Coney Island.

The 10-year-old Olaf was probably born on an Atlantic ice floe. He was captured in Greenland and brought to this country as a 250-pound stripling, to become the first permanent resident of the Aquarium when it opened in 1957. He reached a mature weight of 3,000 pounds by trying to satisfy an insatiable appetite for clams and fish.

Last spring, in an effort to determine just how many clams Olaf could consume, the Aquarium brought in three champion clam shuckers and instructed them to shuck for the walrus as far as they could. They tired before Olaf did.

Though Olaf shared his spacious 100,000-gallon salt water pool with three gray seals and had thousands of visitors each year. he led a lonely life.

Several attempts were made to mate him but they failed because, according to Aquarium officials, he scared away his mates with his rough manners. If he had lived, he would have been mated in the spring with Sabiunuk, a 4-year-old Alaskan walrus.

Dr. Ross F. Nigrelli, director of the Aquarium, said last night an autopsy would be performed today to determine the cause of Olaf's death. He said Olaf probably would have survived to the age of 25 or 30 if he had been left to live wild in Greenland.

Only one other walrus, a female in the Copenhagen Zoo, lived longer in captivity than Olaf, Dr Nigrelli said. However, Olaf grew to a larger size in a man-made environment than any other member of his species.

Because no other marine mammal will respond to his name when called, the Aquarium plans to try to find another walrus, but he will not be considered a replacement for Olaf. Dr. Nigrelli described him as "priceless" and "full of personality."

Autopsy Is Held on Walrus

Dec. 16

An autopsy performed on Olaf, the Coney Island Aquarium walrus found dead Wednesday, showed he died of a twisted small intestine. Dr. Ross F. Nigrelli, the aquarium director, said that the cause of the complication was not known but that it was sometimes found in infants and horses. He said the walrus, who was 10 years old, otherwise had been in excellent condition.

The New York Times

LONG FAMILIAR TO AQUARIUM VISITORS: Olaf the Walrus, who died at the New York Aquarium at Coney Island, his home for most of his 10 years.

A Cool Stop At 70 Below

Christchurch, New Zealand, Oct. 14 (Reuters) — A U.S. Navy Hercules landed in the Antarctic today at a temperature of minus 70 degrees, the lowest in which this type of aircraft has operated.

The temperature was 10 degrees colder than the normal operating minimum.

The ski-equipped aircraft landed at Plateau Station after a 1,400-mile flight from McMurdo Station. It spent only 15 minutes on the skiway unloading men, provisions and mail.

ANNUAL TERN FLIGHT PUT AT 20,000 MILES

WASHINGTON (Science Service)—One of the world's greatest travelers, the sleek beautiful Arctic, tern, flies about 20,000 miles a year. As summer comes to the northern hemisphere, the terns migrate north for a few months and then fly south to Antartic regions for summer in those areas.

During their summer sojurn in the northern hemisphere, they breed in areas of northern Europe, Asia, North America and the Arctic. They have been found as far north as eight degrees from the North Pole. In late summer, the colonies of voyagers start their 10,000-mile journey to seas near Antartica, picking routes over the Pacific Ocean or by the west coasts of Europe and Africa, or even by way of the Indian Ocean.

Scientists have estimated that these terns live in continuous daylight for eight months of the year.

Arctic terns are of the Charadriformes order of birds, which includes gulls, noddies, plovers, sandpipers and auks. The terns have streamlined white bodies, smaller than those of the familiar gulls. Their graceful wings are narrow and pointed, and their heads are topped with black crowns.

Terns seldom soar and drift on the wind as do gulls. Instead they fly with steady wing-beats, often with head and bill pointed downward instead of forward. Thus they spot live minnows or shrimp beneath the sea's surface and capture them by plunging into the water with a splash. Even though their feet are webbed, terns are poor swimmers, as their feet are too small and weak to propel them efficiently.

TWO WHALES SAVED MAY BE LAST OF KIND

SYDNEY, Australia — Skin divers who drove a mother whale and her calf out of Sydney Harbor recently may have saved the last of a rare species on the New South Wales coast. The whales were identified as the rare Southern Right variety by Dr. W. H. Dawbin of Sydney University, who identified the whales from underwater photographs taken by the skin divers.

"The Southern Right whale was the foundation of the Australian and Antarctic whaling industry in the 1800's," he said. "They were considered the 'right whale' to catch, hence the name. They were slaughtered by the thousands. In the Antarctic 200,000 of them were killed by American whalers alone.

By 1900 the herds had been decimated and the Australian whalers had to turn to the sperm whale in the eastern states and the humpback in Western Australia."

In 1929, with sightings of the Southern Right whale almost non-existent, the Australian state governments decided to put the species under total protection. This belated step was followed by other governments throughout the world.

However, protection did not produce new herds and the species seemed doomed. "The odds against the Right whales blundering into Sydney Harbor are incalculable," Dr. Dawbin said.

Satellite May Track Animals

Polar bears and whales may soon be tracked by satellite to study the animals' migratory habits. According to the publication Electronics, naturalists hope to use the orbitting Nimbus weather satellite to pick up signals from a transmitter implanted in an animal and then relay the signal to ground stations.

Japan Doubtful On Whaling Pact

Tokyo, Aug. 25 (AP)—A government spokesman said today the forthcoming four-nation whaling conference may face rough sailing because "there is no sign the Russians are willing to compromise." Japan, Norway, Russia and Britain are scheduled to meet to divide the 3,500 blue whale unit catch quota set on the International Whaling Commission.

OSLO IS PLANNING ARCTIC AIRFIELD

But Soviet May Still Oppose Spitsbergen Installation

OSLO, Norway (UPI) — The Norwegian Government has begun cautious plans to build an airfield on West Spitsbergen, an island of the Spitsbergen archipelago 400 miles west of Norway.

In the past the Soviet Union has been hostile to such plans, and each time Russian reaction has caused Norway to shelve its preparations.

The Soviet opposition to airfields on the islands is based on an article in the 1920 Spitsbergen Treaty, which guarantees "demilitarization" of the area. Spitsbergen's location, within easy bombing distance to the Soviet Union, is thought to be a factor in the Kremlin's opposition.

The treaty recognizes the sovereignty of Norway over Spitsbergen, but grants citizens of the signatories—the United States, the Soviet Union and other European nations—the right to exploit natural resources there.

Since Norway was given the desolate area, Norwegian Governments have tried many schemes to make the region productive and give the outside world some access to Spitsbergen.

At present, a branch of the warm Gulf Stream that touches the west coast of West Spitsbergen gives the outside world its only access to the 24,000 square miles of frozen archipelago. Spitsbergen has 3,000 residents, two-thirds of whom are Russians and most of them are coal miners.

Norway has said it will try to strengthen its interest in Spitsbergen "but not at any cost." The Government has set up a special committee to investigate Norway's activities in the region.

The Minister of Transport, Haakon Kyllingmark, said after a recent inspection trip to Spitsbergen that the only way of establishing a permanent connection between the islands and the mainland would be to set up an air service.

Norway, ignoring Soviet objections, has just completed a satellite tracking station at Ny-Alesund, on West Spitsbergen. It ridiculed Russian assertions the station was a "military installation."

The station's technical equipment has been delayed, however, and probably will not be installed until late next year.

The European Space Research Organization will staff the station with "a few experts" and finance research activities.

Drift barge for Arctic research

Washington

Conceptual design contracts for a unique man-made floating research island, to carry natural scientists into the ice-laden waters of the Arctic Basin, have been announced by the National Science Foundation.

The free-drifting hull would serve as a research platform for scientists conducting research in meteorology, physical and chemical oceanography, the heat budget of the area, marine biology, upper-atmosphere physics, glaciology, and entomology.

Contracts for design, to be completed within four to six months, were awarded to Electric Boat Division of General Dynamics, Groton, Conn.; M. Rosenblatt & Son, Inc., New York; and Westinghouse Defense and Space Center, Baltimore, Md.

* * *

The goal of the contracting firms is to produce designs for a vessel of such strength that it will withstand the terrific stresses and pressure of drifting pack ice and of such shape that it will divert the destructive forces of the ice to avoid their full power.

The research platform would have living- and working-space for about 45 scientists and crew and would carry food and fuel for several years. Its facilities would include scientific laboratories, shops, deep sea winches, hospital, a helicopter pad, and a hangar for a small fixed-wing aircraft.

As presently planned the Arctic drift barge will be towed through the Bering Straits and released in the Arctic pack ice. It is expected that the barge will then drift north and upon nearing the North Pole will either continue through to the Greenland Sea or go into a clockwise circle moving down toward Canada.

The free-drifting research platform is a needed improvement on standard ships, large ice floes, or much larger ice islands, all of which have disadvantages as research bases for Arctic use. Ships might be crushed under the pressure of shifting pack ice. Ice floes are subject to breaking up and equipment used on them must be light enough to be moved if the necessity arises; this limits the kinds of research that may be conducted from them. Ice islands, on the other hand, are too large for some research projects. Their great size, from 40 to 100 square miles in area and up to 150 feet thick, can cause local differences in meteorological and heat budget measurements. Such measurements, if relied upon, would create a false picture of these factors throughout the area traveled by the ice island.

* * *

The design firms have been asked to consider a small nuclear reactor as a source of internal power for the drift barge. If the reactor is approved as the prime power source, it would be backed up by a conventional fossil-fuel-burning system. The possibility of using waste heat or steam to melt ice gripping the hull will also be studied by the designers.

The National Science Foundation hopes the drift barge can be placed in the Arctic Ocean in the early 1970's.

Army Serves Drink Cooled With Ice 2,000 Years Old

WASHINGTON, Sept. 21 (UPI)—What would you expect a soft drink cooled with ice formed almost 2,000 years ago to taste like?

The combination was served here by the Army yesterday as it reported on the success of its scientists in drilling a hole 4,562 feet deep to the bottom of the ice sheet at Camp Century, 140 miles off Greenland's northwest coast.

B. Lyle Hansen, of the Army's Cold Regions Research Division, said the drilling produced the "deepest and most rewarding hole ever drilled in ice." Like rings on a tree, ingredients at different levels of the ice core give scientists a time-scale of history.

The Coca-Cola drink tasted like Coca-Cola and the ice, taken from the 1,800-foot level and said to have been formed "about the time Christ was born," tasted like ice. As the drink was poured "on the rocks," there was a crackling from the release of air bubbles trapped for almost 2,000 years.

With $600,000 provided by the National Science Foundation, the Army has conducted its drilling in Greenland since 1961. It expects to wind up next year with enough ice and data to study 10,000 years of history —the minimum time the present bottom layer has been on Greenland.

A team from the Army Materiel Command struck bottom at Camp Century last July 4.

Permafrost Layer Studied By Scientists in Greenland

WASHINGTON (Science Service) — Scientists have found what might be 2,000 feet of permafrost under the Greenland ice cap. A coring drill dug the deepest ice core in history.

Temperatures lower than anticipated were discovered at the bottom of the hole drilled through the icecap. Calculations anticipated temperatures at freezing or above, but temperatures were found to be about nine degrees F. (23 degrees below freezing)

These low temperatures may indicate that there are 1,500 to 2,000 feet of permafrost beneath Greenland — more than in any other place.

The lowest temperature of the core was minus 12 degrees F. at depths of about 426 feet. From then on temperature increased at lower depths, because of the heat generated by the immense pressures and grinding frictions of the ice cap and by the heat of the earth.

Rare Birds On the House

Copenhagen, Aug. 9 (Special) — White gerfalcons exist only in Greenland and because of their extreme rarity their export from the country has been forbidden for more than a century.

Today Denmark broke the ban for the first time and gave the U.S. Air Force a pair as a token of gratitude for helping sick and wounded Danes and Eskimos in Greenland. The falcon is the mascot of the U.S. Air Force Academy.

The Valley Is Mostly Hidden

By WALTER SULLIVAN

The New York Times

Aug. 20

One of the most remarkable features of the earth's surface is an almost continuous valley that snakes across it for some 40,000 miles. Its existence has become known only in recent years because most of it lies under water. It cleaves the mid-ocean ridges that bisect the great oceans, in particular the Atlantic, and is visible only in the few places where it appears above water.

Such is Iceland, which forms a portion of the Mid-Atlantic Ridge. The rift valley cuts directly across that island. Another exposed segment extends from the Dead Sea down through East Africa.

These valleys are areas of movement and frequently generate earthquakes. They are also marked, in places, by volcanic activity, as in Iceland. They manifest ferment deep within the earth that must be related to the existence of continents and oceanic basins, but the tale they have to tell is far from understood.

This summer some of the last uncharted portions of this ridge-and-rift system have been filled in on the maps, thanks largely to the work of American and Soviet oceanographers. What they seem to show is that the system was torn asunder by fracturing of the earth's crust east of Greenland. There, the southern sector of the system is displaced 300 miles southwest of the northern sector, which runs from north of Greenland across the Arctic Ocean toward the Lena River of Siberia.

In a recent study by two scientists of the Naval Oceanographic Office in Washington it is proposed that Spitsbergen may once have been north of Greenland. Crustal movement then shifted it southeast, parallel to the newly discovered fracture zone. Whatever the nature of the fracturing process, it is not ended, for the fracture zone is still a frequent producer of earthquakes.

The authors, G. Leonard Johnson and Oscar B. Eckoff, note that this hypothetical movement parallels the so-called de Geer line, a geographic feature extending from the mouth of the Mackenzie River, along the Arctic rim of the Canadian islands and Greenland toward Norway. It has been proposed that the line represents a shearing of the earth's crust whereby Norway was shifted from an earlier position near the east coast of Greenland.

The Navy scientists have reconstructed the ocean floor structure between Greenland and Spitsbergen from soundings made by a long succession of expeditions. The earliest of importance, they say, was that carried out in 1937-38 by an American woman, Louise Boyd, in the ship Veslekari.

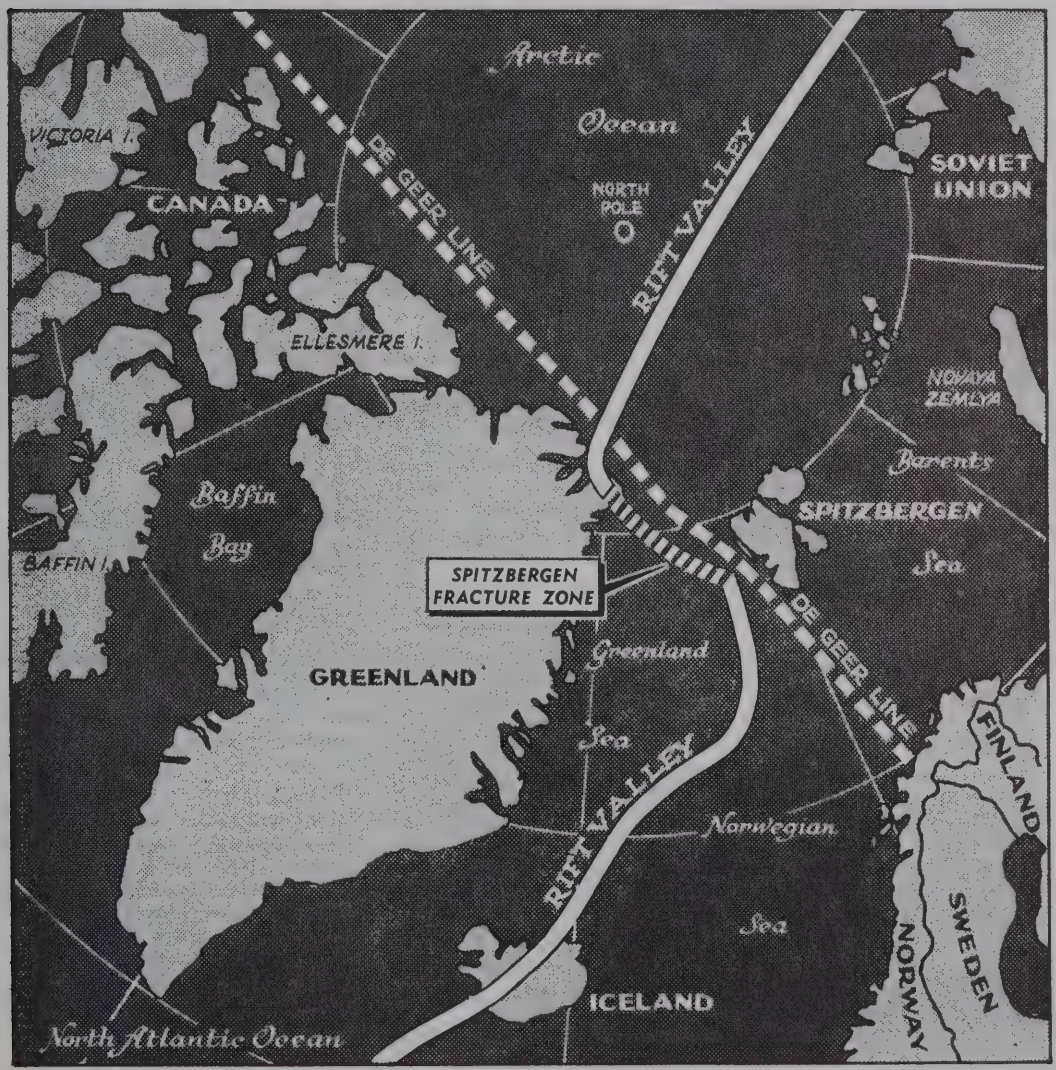
This was followed in recent years by the extensive journeys of Soviet research ships, some 5,400 miles of soundings by American icebreakers, plus work done by nuclear submarines — notably the U.S.S. Nautilus. Soundings farther north, in the pack ice of the Arctic Ocean, were made from stations established on the drifting ice. Further information from aerial magnetic surveys was reported this summer at the international oceanographic congress in Moscow.

Mrs. R. M. Demenitskaya of the Institute of Arctic Geology in Leningrad said these flights had shown a zebra pattern of magnetism on the floor of the Arctic Ocean parallel to the ridge system. This follows the patterns found in recent years on the floor of both the Atlantic and Pacific Oceans.

The pattern shows up if one charts the magnetic "anomalies." These are areas in which the earth's magnetism departs from normal. Some are positive, magnetically, and some negative. If one shows the positive anomalies as black and the negative as white, a zebra pattern emerges.

Some believe the oceans are paved in this manner because hot, soft rock has been extruded from rifts in the mid-ocean ridges for millions of years, spreading slowly over the ocean floors on both sides of those rifts. This material, when it cools, captures the orientation of the earth's magnetic field at that time. It is argued that since the field periodically reverses its polarity, the oceans are paved with successive bands, each polarized in the opposite direction from its neighbors.

Mrs. Demenitskaya reported that the bands in the Arctic, like those elsewhere, were from 5 to 10 miles in width. Dr. Bruce C. Heezen of Columbia University's Lamont Geological Observatory termed these reports "very exciting." It has been he, as much as anyone, who has identified the worldwide system of mid-ocean ridges with their rift vallevs.



A new theory has been advanced to explain the eccentric pattern of the ocean floor between Greenland and Spitzbergen. Recent oceanographic studies of previously uncharted portions of the 40,000-mile worldwide mid-ocean ridge and rift system reveal that it extends across the Arctic Ocean. The studies also show that the Rift Valley shifted by some 300 miles (as shown by the striped pattern on map) between Spitzbergen and Greenland. This shift, a zone marked by frequent earthquakes, parallels the de Geer line, a hypothetical line of cleavage in the earth's crust extending from the Mackenzie River in Canada to the vicinity of Norway. It is thought that Norway once lay close to Greenland, and Spitzbergen lay north of Greenland until forces along the de Geer cleavage shifted them eastward. One of the major studies was carried out by two American scientists.

Arctic Maneuvers

Narvik, Norway, Sept. 1 (Reuters) — Fifteen hundred U.S. troops are being airlifted across the Atlantic to take part in exercise "black frost" which starts tomorrow 100 miles above the Arctic Circle in northern Norway. More than 6,000 troops from Norway, the U.S. and Britain will take part in the seven-day demonstration of Nato flexibility and mobility.

'SEWARD'S FOLLY' MARKS 100TH YEAR

Alaska Begins Celebration of its Purchase

JUNEAU, Alaska, Dec. 31 (AP)—Alaskans will set off their biggest celebration since statehood tomorrow.

With the dawn of 1967, the state's 272,000 residents start marking the 100th anniversary of Alaska's purchase from Russia by the United States.

In 1867, Secretary of State William H. Seward negotiated the purchase of Alaska for $7.2-million—2 cents an acre. All he got for it was criticism. Alaska was popularly regarded as "Seward's folly."

Throughout their 586,400 square miles of land, Alaskans will be commemorating for one year the purchase, which culminated in statehood eight years ago next Tuesday. The focal point will be Fairbanks and that city's Alaska 67 exposition.

Congress appropriated $4.6-million to be used on a matching basis for centennial projects. It also put up $600,000 for traveling Smithsonian Institution exhibits tracing Alaska's history from the 16th century.

Congress directed that Federal funds be used only for centennial projects of lasting economic benefit. Consequently, community centers, libraries, information centers and museums, are going up, and historical sites and monuments are being restored.

Anchorage is constructing among other things, a museum and fine arts center and a performing arts center.

Other centennial projects include a state museum in Juneau, restoration of old Fort Kenai in Kenai, a city auditorium in Skagway, an aquarium in Kodiak, community centers in Sitka and Valdez, a youth center in Barrow and campgrounds at various locations.

Pageants depicting Alaska's early history, particularly the pre-purchase era, are scheduled throughout the state during the summer tourist months.

The Alaska 67 exposition site at Fairbanks, to open May 27, will include a mining valley, complete with old and new equipment; a gold rush town; Federal, state and community exhibition halls; and the sternwheeler Nenana, refurbished to include a restaurant and a transportation display.

Alaska expects 200,000 visitors during the year-long celebration.

Russians Now Regret Selling Alaska to U.S.

MOSCOW, Dec. 22 (UPI) —How much is $7.2-million?

"Next to nothing," the Soviet press agency Tass said tonight in a dispatch indicating Russia is sorry it sold Alaska to the United States for that amount.

Tass said a notebook, kept by a 19th century Russian who worked in Alaska, had been found, giving interesting data on Alaskan geography, history, economics and ethnography.

Tass added that the Tsarist government of Russia "sold the territory of Alaska and the Aleutian Islands (which were discovered by Russian sailors) to the United States for next to nothing."

Military Plans for Agattu Scored

The National Audubon Society appealed Sept. 30 to Defense Secretary Robert S. McNamara to keep planned military operations out of Agattu Island in the Aleutian Islands National Wildlife Refuge.

Carl W. Buchheister, president of the society, said the organization had learned the Air Force "intends to place what it calls a 'classified mission' on Agattu."

He said he did not contend that the mission was not "essential to national defense." He said he did not intend to find out. But, he said:

"We do question that it is necessary to put any kind of military operation, secret or not, on Agattu when larger Attu, already despoiled by military operations, is less than 40 miles away and even closer than Agattu to any actual or potential enemy in Asia. We cannot believe the nature of the mission requires a virgin wilderness to destroy."

The New York Times Oct. 1, 1966
Cross shows Agattu Island

Polar Bear Cubs Tiny at Birth

Polar bear cubs are only about 10 inches long at birth and weigh slightly more than 1½ pounds, The Associated Press says. Males often grow to eight or 11 feet in length and weigh 1,000 pounds.

Kangaroos' Cold Resistance To Be Examined in Alaska

SYDNEY, Australia (Reuters)—Six baby kangaroos are to leave for Alaska shortly, where they are pledged to receive "loving, tender care" while scientists study how they adapt to the cold weather.

Dr. Jan Luick, a Fulbright scholar who has been studying the metabolism of sheep at New England University in Armidale, Australia, arranged the shipment to the University of Alaska's Institute of Arctic Biology.

He promised the tender, loving care, in the advertisement he placed to get the kangaroos.

He plans to study both their adaptability and how they use nutrients, in a project which includes comparisons with moose, reindeer, buffalo and mountain goat.

Kangaroos on Way to Alaska

FAIRBANKS, Alaska, July 23 (AP)—Six baby kangaroos left Sydney, Australia by plane yesterday for the University of Alaska in Fairbanks, where a study will be made of how their metabolism is affected by the cold.

Alaskan Tourism Increasing

Signs of a tourism industry are developing in Alaska because of the efforts of the Alaska Travel Division, airlines, steamship companies and tour operators, says American Express. Visitors are arriving in increasing numbers each year by plane, train and steamer to explore the unusual ports along Alaska's 34,000 miles of coast and enjoy the scenic beauties of the state's interior.

A Huge Radar Antenna Is in Operation in Alaska

84-Foot Rotating Dish Is One of 5 in Use by Air Force Throughout the World

CLEAR, Alaska, July 7 (AP) —A huge new ultrasensitive electronic eye has been put in use as another defense against a sneak missile attack on the United States, the Air Force disclosed today.

A rotating 84-foot parabolic radar dish antenna began operating at the Clear Ballistic Missile Early Warning System site "within the last few weeks," the Air Force said, declining on security grounds to give the exact date.

Housed in Domes

The big radar unit, weighing some 185 tons, can detect and track a 16-inch piece of wire 1-32d of an inch in diameter at a distance of 2,500 miles, the Air Force said.

It is one of five in operation at the three B.M.E.W.S. sites operated by the Western allies. One is at Thule, England, and the three others are at Flyngdales Moor, Yorkshire, England.

The tracking radar dishes are housed in a plastic dome that resembles, more than anything else, a mammoth golf ball—140 feet in diameter and 10 stories high—as a protection against weather.

The electronic dishes, each costing $19-million, can scan potentially unfriendly skies from horizon to horizon.

They are operated in conjunction with fixed detection radar screens, three at Clear, two at Flyingdales Moor and four at Thule.

Completed in Seconds

Should an unidentified object be detected, either by the rotating radar trackers or the fixed screens, the trackers lock on the foreign body until it is determined whether it is a ballistic trajectory. If so., the tracker backtracks the object and determines its launching point, its point of impact and the time of impact.

The computation is completed within seconds, and the information transmitted automatically to the Pentagon, to the Strategic Air Command at Omaha, to the North American Air Defense Command at Colorado Springs, and to England's Royal Air Force.

If the object tracked poses no ballistic threat to the United States, Canada or the United Kingdom, the lock-on is automatically broken and the rotating scanner resumes its detection mission.

Col. Earl N. Yaden, Air Force station commander at Clear, emphasized that the new radar tracker was installed to improve missile detection operations and not to fill any gap in the fixed screen system.

"At the present time, with known weapons systems now in existence, the B.M.E.W.S. sites at Clear, Thule and Flyingdales provide the maximum detection capabilities required," Colonel Yaden said.

EUROPE SPACE UNIT PLANS ALASKA BASE

WASHINGTON, Nov. 28 (AP)—The members of the European Space Research Organization are about to set up a tracking station in Alaska.

It will be built by European funds, with European materials, in the Fairbanks area near the University of Alaska and close to the National Aeronautics and Space Administration station already in service.

Its primary function will be to receive radio telemetry from and send commands to the scientific satellites to be launched by the European group next year.

Esro 2, designed to study solar radiation and cosmic rays, will be launched by a Scout rocket from Vandenberg Air Force Base, Calif., in late January or early February.

Esro 1, carrying instruments to measure energetic particles and their effect on the atmosphere, will be launched, also from Vandenberg, late in 1967. The Esro 1 launching originally was scheduled to be first, but the Esro 2 project was ready sooner than expected.

Esro 2 will carry five experiments, assembled by scientists of the United Kingdom, the Netherlands and France. The other will have three United Kingdom experiments and one each developed by one nonmember country, Norway.

Aleutian Island May Be Test Site

ANCHORAGE, Dec. 21 (AP)—The possibility of Amchitka Island in the Aleutians being used as an underground nuclear test site is under study by an Atomic Energy Commission survey team now on the island.

The team "will soon be followed by crews drilling exploratory holes if the surface geology makes underground exploration appear desirable," an AEC spokesman said yesterday.

The AEC said it was searching Alaska for a site where certain tests can be conducted with a minimum of local disturbance."

BERING POWER

WASHINGTON (UPI)—**The Navy has installed a nuclear generator on Fairway Rock in the Bering Straits, 10 miles off Alaska, to provide power for an oceanographic station measuring currents, temperatures and other sea conditions.**

Ice and Fog Are Among Hazards On Voyages to Eskimo Villages

U.S. Freighter Is on the Way to 20 Settlements Strewn Along Alaskan Shores

By HOMER BIGART
The New York Times

Aug. 20

The 10,000-ton freighter North Star III of the Federal Bureau of Indian Affairs sailed last week from Seattle for some of the dreariest ports of call in creation.

She will drop cargo at about 20 Eskimo settlements strewn along the Alaskan shores of the Bering Sea and the Arctic Ocean. Her skipper, Capt. Walter S. Hammond, hopes to get her in and out of Barrow, the northernmost port on the continent, before the ice pack locks up the Arctic coast in September.

These are tense voyages. Unloading at the Arctic ports of Barrow, Wainwright, Point Lay and Point Hope, Captain Hammond keeps looking nervously back over his shoulder, fearing entrapment by the ice.

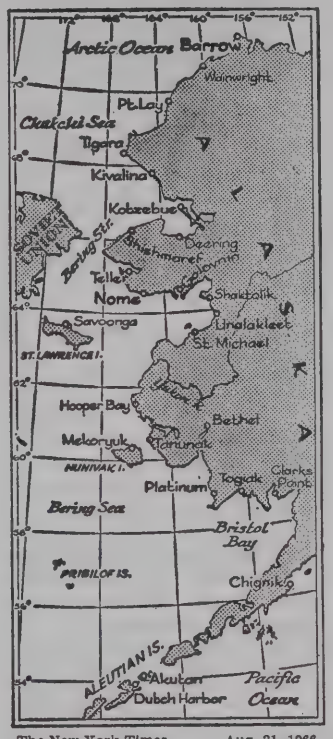
A strong westerly wind is what he dreads most, for this wind could cut off escape by sending the ice pack drifting eastward against Icy Cape or one of the other promontories of northwest Alaska. Everyone on the North Star breathes easier once Icy Cape, 130 miles southwest of Point Barrow, is put behind on the homeward journey.

The huge first mate of the North Star, Cecil (Moe) Cole, who is built like a Kodiak bear, thinks Captain Hammond must have a sixth sense about ice.

Mr. Cole recalls a visit to Barrow two years ago. It was Captain Hammond's first year as skipper. Captain Hammond sensed that the ice was closing in and put the ship to sail without even waiting for his lighterage boats to be hauled aboard. Telling the boats to follow along, he outraced the ice, anchoring 20 miles to the southwest of Barrow until the ice retreated.

Barrow has only a few ice-free weeks in late summer. The best time for arrival is around Sept. 1. On this 87th voyage to the far north, the North Star expects to reach Barrow Aug. 31 and depart Sept. 9. After calling at Wainwright, she will clear Icy Cape Sept. 14 and presumably be safe from the impending freeze-up.

There are other hazards. The Bering is a very shallow sea, gray, foggy and sinister even in brief periods of midsummer calm, and a howling terror during autumn gales. Each summer the North Star makes two trips to the Bering Sea. On her first voyage, in spring and early summer, she never ventures much beyond the Bering Strait, for the ice limit does not usually retreat through the strait until July.



The New York Times Aug. 21, 1966

Supply ship now on her annual voyage carries essential goods to lonely northern ports shown above.

The Bering Sea is not well charted, and much of the coast is girt with shoals and mudflats. Very few of the 75 settlements served each year by the North Star have harbors and only St. Michael and Kotzebue have their own lighterage services. Elsewhere the arrival of the North Star resembles an unopposed amphibious landing in World War II.

She is a 1945 Victory ship, probably the first of her class to be diesel-motored, and at her normal speed of 16 knots she shimmies so feverishly that the radar screen sometimes clouds up. This year her bow was armored with additional steel plating to help her cut through ice.

On her decks she carries four LCM's (landing craft mechanized) and her skilled crew can put them all in the water inside an hour. Off some settlements near the mouths of the Yukon and Kuskokwim Rivers, and in Norton Sound, the sea is so shallow that the North Star must anchor 15 to 20 miles at sea. Then it takes all day for an LCM to make a round trip between ship and settlement.

Often the first LCM will carry no cargo but a bulldozer that prepares a beachhead for the landing of the supplies. Every Eskimo in the village suddenly materializes on the shore and the Eskimos form antlike columns toting the cargo up the muddy slopes to the village storehouse. Invariably it is rainy, chilly and thoroughly disagreeable.

Eskimo children, some of them smaller than the boxes they are carrying, receive a metal token when they deliver their cargo at the storehouse. These tokens are later exchangeable for nickels and dimes and may be the only cash the children will see for a year.

During lulls in the unloading, Moe Cole lumbers through the mobs of children distributing candy, bubble gum, harmonicas and horns. He has given away several tons of candy since he joined the Bureau of Indian Affairs in 1937.

The cargo for any settlement will generally contain a year's supply of groceries for the bureau's village schoolteacher, supplies for the village store and some occasional reindeer as the nucleus of a new herd. The reindeer cows are attracted to caribou bulls and if caribou happen to migrate through a herd of reindeer the cows are generally lured away.

One Eskimo settlement looks pretty much like any other. The Bering and Arctic coasts are treeless, so the Eskimo shacks are of tarpaper and driftwood carried to sea on the great floods of the Yukon and Kuskokwim and washed ashore.

In some of the more desolate villages like Kivalina, where even driftwood is scarce, Eskimos are still living in sod houses so damp and crowded that probably one of five have arrested cases of tuberculosis.

The mainland coastal settlements are nearly always on flat and marshy tundra. The North Star also calls at several islands that are mountainous but equally bleak.

St. Lawrence Island is typical. On a clear day you can see Siberia, 40 miles across the International Date Line. It is almost never clear.

When the North Star paused at Savoonga on St. Lawrence Island last July all the sled dogs were howling, perhaps in protest against the discontinuance a few years ago of the last dog-sled mail route.

Cameraman Rescued on Peak

TALKEETNA, Alaska, Aug. 7 (AP)—A Hollywood cameraman stranded alone for eight days in a small cabin high on 20,320-foot Mount McKinley was rescued unharmed yesterday. Wolfgang Bayer, 32 years old, was on assignment for the weekly television program "The American West."

Aklavik: A Town That Defied an Order to Die

By JAY WALZ
The New York Times

AKLAVIK, Northwest Territories, Aug. 28—Aklavik, despite government edict, refuses to die.

Ten years after it was condemned as unfit for human habitation, this Mackenzie River delta town, whose Eskimo name means "place of the barren land grizzly bear," is by Arctic standards very much alive.

The Canadian Government, abandoning its drive to evacuate the population—now passing 900 after reaching a low of 600—is, instead, moving back in.

The Hudson's Bay Company, the symbol of determined free enterprise through the vast Canadian Northwest, is erecting a new $100,000 store dealing in everything from muskrat traps to stereo phonographs.

Aklavik was settled 60 years ago to trap the muskrat that burrows, multiplies and thrives in the Mackenzie River mud, silt and scrub. The Hudson's Bay Company moved in shortly after to buy the pelts, and as late as 15 years ago the trapping and trading was reported to be a million-dollar industry.

At the same time, Aklavik served as a meeting place for river barges coming down from Great Slave Lake and the coastal schooners carrying supplies to Port Brabant and Cambridge Bay on the Beaufort Sea.

Unfortunately, by modern standards, Aklavik doesn't work. It floods. Its silted banks erode. The soil won't drain. The permanent frost underground is giving way. The streets in summer melt into mud.

On top of all this, the fur trade has declined to a fraction of its former worth, and the Eskimos and Indians depend on federal relief.

Deciding against patchwork rehabilitation, the Government built an entirely new town, Inuvik, 35 miles to the east, on the edge of the Mackenzie delta.

Inuvik is hailed by Government officials as a $50-million showcase for northern development. But critics call it an extravagant folly, an "incubated town" and a "figment of bureaucratic imagination."

The Eskimos and Indians, who have given up a long-standing "war" for a policy of peaceful mutual avoidance, now join in one thought. Both prefer proud squalor in Aklavik to the white man's ways in modern Inuvik.

Inuvik, they tell a visitor, may be only 35 miles by airplane, but is 70 miles distant by canoe or on foot. That's a long way from familiar trapping grounds that to a true native will always be home. Even the men who have migrated to Inuvik and have service jobs with the Government never forget that they are trappers by tradition.

The New York Times Aug. 29, 1966
Aklavik (cross) has defied attempts to evacuate it.

Victor Allen, for example, drives a truck for the navy station at Inuvik. But he is, more importantly, president of the Inuvik Trappers Association.

"The trapper," Mr. Allen said to a visitor, "is a proud man. He wants to be independent." He recommends price supports on pelts and equipment loans instead of "relief handouts."

Mrs. Ruth Furlong, an Aklavik trapper's wife, said her family remained in the old village because "we couldn't trap over there." "The muskrat would be too far away, and so would be the caribou," she added.

The caribou that wanders into the delta from the nearby Richardson Mountain range is almost certain to end up on some Eskimo table. It is the first choice of meat in Aklavik, but during the trapping season the muskrat is the diet staple.

Mrs. Furlong said her husband caught 400 muskrats last spring and received $2 to $2.10 apiece for the pelts. But her husband, she insisted, is "only a beginner," and more experienced trappers sold 1,200 or 1,600 skins. Thus, she explained, a trapper's income might total an impressive $3,000 to $3,500 for a season.

The Government estimates that Aklavik's trappers average less than $1,000 yearly from their favorite occupation. There are poor years when muskrats, for some reason, are not around, and prices in a declining market are far from secure.

Eskimos and Indians have a way of not revealing their dependence on government relief. Officials in the Department of Northern Affairs estimate that at least half are on welfare rolls for an average of four months each year. Welfare payments run about $20 a person a month.

Government administrators concede that they see little prospect for the Eskimos and Indians to continue their old ways long. The Government has decided that "reconstruction of Aklavik is desirable," but not because it was wrong to attempt the migration to Inuvik.

"We are coming back just because we couldn't get the present Eskimos to move," said David Milstad, Northern Affairs regional administrator. "The people wanted to stay here and there is no way of preventing them from doing so."

"Coming back" means setting up hospitals, clinics and schools, building sidewalks and perhaps even paving streets. How long this will go on is an unanswered question.

Some Government administrators feel that if the older Eskimos can't or won't adjust to a new life in Inuvik, perhaps their children will.

Louis Goose, a 16-year-old Eskimo, said he didn't know about this, but suggested that family ties were responsible for his indecision.

Louis, who has worked at the Hudson's Bay store as a summer helper, will go to the excellent Sir Alexander Mackenzie School in Inuvik when the September term opens. He will live in winter in the school hostel, which is equipped for modern living.

"I'm not sure what I'll do," Louis said on the question of seeking a future in Aklavik. "My family is here, and I just don't know whether I'll leave. Another year in school may tell me what to do."

OUTPOST THRIVES ON ITS REINDEER

Income From Herd of 10,000 Helps Canadian Eskimos

REINDEER DEPOT, Northwest Territories (Canadian Press)—If Santa Claus ever decides to move from the North Pole he would do well to stay at Reindeer Depot.

It has 10,000 reindeer grazing within a few miles; eight herders to round them up; women to sew moccasins and other suitable clothing, and a Hudson Bay Company trading post from which to fill his sack. There is even a harness for hitching reindeer to a sled—one of the last of its type—hanging on the wall of the one-room schoolhouse.

Reindeer Depot is on the Mackenzie River 25 miles south of where the mighty waterway empties into the Arctic Ocean. One reaches it by arranging by air from Inuvik to Tuktoyaktuk, or by motor boat from either place.

Reindeer Depot actually is one of the first attempts at a federal project in the North. It was founded on the recommendation of the explorer Vilhjalmur Stefansson, who said Canadian Eskimos should be trained as reindeer herders for a livelihood. But it did not work out as Stefansson predicted.

It took six years to bring the reindeer from Alaska to their grazing ground east of the Mackenzie. Arriving in 1935, the herd had been reduced to about 2,300 animals from the original 3,000. The government then built Reindeer Depot, a group of white frame buildings powered by electricity and linked by wooded sidewalks, at the foot of a cluster of spruce-covered hills.

$1-Million Spent by '62

From then until 1962 about $1-million was poured into the project. The reindeer survived, but there was trouble recruiting herders. The project provided an income for a handful of families. In the early 1950's the Government tried giving individual herds to Eskimos but with no success.

"The Eskimo found it too much work for too little income," says Sven Johansson, a 41-year-old Swede who took charge of the program four years ago. "Herding methods were out of date and the reindeer overgrazed."

Now the herd is under control again. Herders, with a salary of $350 a month, free meat, sick pay, free housing for their families and even life insurance, are among the affluent Eskimos in Canada.

The project still costs about $80,000 a year, but Mr. Johansson says it should be self-supporting in five years.

"We want to build the herd to about 30,000. This would produce 500 tons of meat a year, enough to help support the North. We could even export it."

Reindeer meat, which tastes like extremely lean beef, is already a staple in the diet of most residents of the region. Today the reindeer graze over 7,000 square miles, from Reindeer Depot to the Anderson River 100 miles east, and from Inuvik 50 miles north to the Arctic shore.

IRON FIND AWAITS A LINK TO WORLD

Development in Baffinland Is Studied by Canada

By JAY WALZ
The New York Times

MARY RIVER, Northwest Territories, Aug. 26—High in the Baffin Island Arctic, a party of Canadian officials and planners this week inspected the site of newly found riches. It is a black-hooded mountain ridge full of "unquestionably the best iron ore in the world."

Greeting his visitors on the mountain slope, Murray Watts, president of Baffinland Iron Mines, Ltd., said: "You will find no amenities here. Indeed, there is no settlement whatsoever."

That was to say the town of Mary River, which Mr. Watt's company has on the drafting boards, is in reality a small cluster of canvas-covered bunkhouses, a commissary tent, a shed for the diesel generator and a shack serving the radio operator and the engineers.

The Mary River tumbles off the mountain in a series of picturesque falls and rapids. The green tundra fed by last winter's snow runoff and this week's rains was sprinkled with tiny, rainbow-colored flowers. The caribou and white rabbit were out of sight.

Mary River's tiny population was temporarily expanded by the presence of important businessmen, economists, financiers and bureaucrats led by Arthur Laing, Minister of Northern Affairs.

In numerous lakes all around, fine, hungry trout nibbled on fishing lines and were taken by some of the guests. Also, in the Atlantic Ocean approaches at Milne Inlet were excellent specimens of a prized northern fish, the Arctic char.

Mr. Watts's consortium of companies has spent $2.5-million since 1964 on operations preliminary to mining a fabulous quantity of ore. Mr. Watts spoke of prospects of removing at least 130-million tons.

The 15-mile range staked out by Baffinland Mines contains ore so rich that it could be shoveled into a blast furnace without the usual expensive processing. The ore here, Mr. Watts says, is 69 per cent iron —that is, magnetite and hematite.

This week's visitors, including members of the Economic Council of Canada, the Government's official advisory body, landed on Mary River's hastily built gravel airstrip at the outset of an 8,000-mile tour to study at close hand means of developing the northern wasteland that makes up one-third of this country's territory.

The New York Times Aug. 28, 1966

SITE OF IRON RICHES: Cross marks Mary River.

Mr. Laing told the council members: "We can show you our wealth of resources. We want you to advise us how to use them."

Aside from economic development, Mr. Laing says, the Government hopes to introduce industries to improve the standard of living of Canada's 12,000 Eskimos and 10,000 Indians in the Northwest Territories.

If this Mary River mine were close to Pittsburgh, or to the steel-producing centers of Germany or Japan, fortunes here would rise in short order. The "if," however, has so far blocked the way. For, as Mr. Watts pointed out, Mary River is more than 3,000 almost-impossible miles from Pittsburgh and as many miles from Rotterdam, the most probable European point of delivery.

Mary River is a cruel 600 miles north of Frobisher, a Government distribution point in southern Baffin Island.

To travel north of Frobisher is to move immediately into the world of trackless wastes and winter ice. The inlets and the sea lanes are never clear of pack ice until late June, and they begin freezing in early September.

To operate economically and profitably, Mr. Watts estimates his company would have to produce at least two million tons of ore a year. To ship so much cargo in so short a period as three summer months is unheard of.

Mr. Watts urged the economic advisers to recommend a substantial program of federal aid. He suggested that the Government build a railroad over the 65-mile valley to Milne Inlet, whose deep harbor might be provided with a dock, again at government expense, to accommodate ore ships of 150,000 tons.

The cost of the whole development would easily run to $100-million, and the Government must soon inform the company whether it is that serious about developing the north. Representatives of the Government here this week appeared far from a decision, with some officials willing to consider going ahead since it would encourage development elsewhere. Some observers called the whole idea reaching for "pie in the sky."

Baffinland's problem is not unique. Remoteness and transportation difficulties have held back northern development since the decline in fur trade forced the 300-year-old Hudson's Bay Company to shift from fur trading to retailing. But, as with all prospectors, Baffinland's promoters are tenacious.

ESKIMOS AIR VIEWS ON ARCTIC 'HOT LINE'

OTTAWA (Canadian Press) —It has to be the coldest spot in the world for a "hot line" radio program. And, as far as is known, it is the only one anywhere in the Eskimo language.

The program, where telephone calls from listeners are broadcast live on the air, is carried by CFFB at Frobisher Bay, a 40-watt station of the publicly owned Canadian Broadcasting Corporation that serves the main community on Baffin Island.

For 30 minutes a week, Eskimos keep the station's switchboard buzzing as they call in to give their views on local problems.

Despite the fact that Frobisher Bay is 1,300 miles north of Montreal and only 200 miles from the Arctic Circle, many topics raised on the program are akin to those heard on similar programs in the heavily populated areas of Canada.

One question that got a lot of attention was election of new members to the Territorial Council, governing body for Canada's North.

Other "hot line" programs have discussed allocation of 50 prefabricated houses shipped to Frobisher during the open summer season by the Northern Affairs Department.

The "hot line" program is conducted by Tkayik, an Eskimo free-lancer. There are two other Eskimos, Jonah Kelly and Ann Hanson, among the six-announcer - operators on the staff.

Among the station's unique problems is the difficulty of translating the news into Eskimo. Callers often complain that translations are not adequate.

The station really is trilingual. The bulk of its broadcasting is in English, but it carries some French programs as well as its two hours a day in Eskimo.

Yukon Pay Scale Of Federal Aides Stirs Local Envy

WHITEHORSE, Yukon (Canadian Press) — Employers across the Arctic are worried about how to attract and keep qualified workers. Their chief competitor is the Federal Government. The Government is the largest employer in most locations. Government employes are paid northern allowances in addition to regular civil service pay and fringe benefits in order to compensate for high living costs and hardships associated with the long winters.

But the allowances have created difficulties for both the employers and employes of private firms and other organizations in the north. A recent arctic tour by a 40-member economic mission found the problem lacked an easy solution.

A Federal civil servant, for instance, might be in a job with a base pay of $6,500 a year but various allowances and northern benefits may bring his effective income to more than $12,000 a year. Other employers in the territory may supplement a $6,000 income to bring it to more than $8,000.

But a local small-business man considers an imcome of $6,000 a year about all he can hope to make. And a trapper is considered lucky if he can make more than $2,000 a year.

This has led to envy of the Federal civil servant who is likely to remain in the north only for a few years. The wife of a general store merchant at Inuvik, Northwest Territories, told the economic mission:

"The people with the least commitment to the country get the best return for their efforts."

However, the permanent residents of the north don't want the temporary civil service residents to be deprived of the northern allowances because they fear this would affect their own incomes.

Instead they hope the Federal scale will induce local employers to pay more.

Eskimos Get Feather Surfeit

EDMONTON, Alberta (Canadian Press)—When Eskimos who were planning a drumdance festival at Tuktoyaktuk, Northwest Territory, needed some eagle feathers, Tom Butters of Inuvik sent an urgent plea to The Edmonton Journal. He asked readers to tell him if they knew where eagle feathers could be found. Recently the paper received an even more urgent plea—by telegram. It read: "Stop feathers stop inundated stop somebody is sure to show up with tar stop thanks—Butters."

AID TO NORTHWEST URGED ON CANADA

Board Asks Vigorous Steps for Indians and Eskimos

By JAY WALZ
The New York Times

OTTAWA, Oct. 5—A federal advisory commission urged the Government today to adopt vigorous measures for a political and economic advance for the Indians, Eskimos and others inhabiting Canada's vast Northwest.

"The North is Canada's neglected backyard," said the advisers in a report. They noted that many maps used in Canadian schools did not show areas such as Grise Fjord, on Ellesmere Island, where Eskimos live.

"Indeed, to the northerns, one of the troubles of the North is the South," observed the commission.

While the sparse population —one inhabitant to 50 square miles—poses difficult development problems, Canada must not shirk her duties to offer meaningful citizenship to the indigenous, often primitive peoples who for centuries have dwelt in the Arctic and sub-Arctic regions, the report said.

The recommendations were laid before Parliament at the opening of its new session today. During the last 16 months three commissioners led by A. W. R. Carrothers, Dean of Law at the University of Western Ontario, traveled 10,000 miles and held public meetings and interviews with more than 3,000 people.

The Northwest Territories embrace the third of Canada lying north of the 60th Parallel, except for the Yukon on the Alaska side and the northern tip of Quebec. The mainland and archipelago cover 1.3 million square miles. The natural resources, especially underground, are potentially great.

But the territory, five times the size of Texas, has only 25,000 inhabitants, less than the population of Ithaca, N. Y. The Northwest Territories have 6,000 Indians, 9,000 Eskimos and 10,000 "others" (whites and persons of mixed white and Indian ancestry.)

"The indigenous peoples of the North crave educational and economic opportunities," the report said, but the annual income of Indians and Eskimos is less than one-sixth that of the white man and the cost of living in the North is substantially higher than in southern Canada.

While 10,000 people in the North were reported "living well, 15,000 live dreadfully."

Indian and Eskimo incomes are so low as to bring them within the scope of the poverty problem of Canada and at the lowest and most depressed strata of that problem, the advisers said.

Self-government has been evolving in the north for many years, but slowly. Indians and Eskimos vote in federal parliamentary elections and elect 7 of 12 members of their Territorial Council. The council, however, has limited legislative powers.

The Federal Government, through its Department of Northern Affairs and various welfare agencies, pours nearly $60-million a year into the territories. The population has benefited too from such "abnormal" enterprises as the American Distant Early Warning Communications System.

However, only a few settlements, notably in the Mackenzie River valley, have mining or other industries important enough to "go it alone" economically. Agriculture in the bush and tundra country is nonexistent. Eskimos and Indians, by and large, still try to live from trapping, fishing and hunting. Some improve their lot on the fringes of Government enterprises.

The commission concluded that the Northwest Territories was far from ready for provincial status, the Canadian equivalent of statehood. The Federal Government was urged to lead the territory toward the goal of self-rule and self-sufficiency.

The commission recommended first that the seat of territorial government be moved out of Ottawa into a "capital" inside the region. It proposed Yellowknife on Great Slave Lake in the Mackenzie River region.

The commission recommended retaining the territorial commissioner now appointed by the Federal Government, but urged replacing the partly appointed Legislative Council with an appointed executive council and a largely elected 18-member legislative assembly.

Territorial development, said the commission, should have the direction of a new Northwest Territories development board backed by a Northwest Territories development corporation with $10-million at its disposal The board would promote and coordinate the public economic development projects, while the corporation would provide loans and guarantees to encourage provate enterprise in the region.

Political developments based on principles of self-rule should include the establishment of local governments throughout the territories, the report said. These do not exist today and tribal customs and disciplines of chieftains prevail.

Most Indians and Eskimos must be taught democratic processes and the commission recommended the creation of an institute of public affairs to take on the educational program.

The needs of education, said the advisers, require nothing short of a "crash program" that would include university training for selected students.

MEDICAL PACKS CUT ESKIMO BABY DEATHS

OTTAWA (Canadian Press) — Eskimo babies are much like other Canadians except that more of them die. One Eskimo infant in 10 dies before it is a year old. That is 3½ times the Canadian average.

However, five years ago the death rate for Eskimo infants was one in five. One reason it has been cut is the Eskimo family medical pack put out by the Department of National Health and Welfare.

About 500 of the packs have been given out by northern nurses to families setting out on the traditional hunting and fishing expeditions. The kits contain medicines and bandages, along with instructions in Eskimo syllabics and English.

Eskimos in the Northwest Territories and Arctic islands now are using the packs, but the idea began along the west coast of Hudson Bay, according to Dr. R. A. Armstrong, senior treatment officer in the medical services division.

As explained in the instruction booklet, each kit contains ointments for "eye sickness" and "skin sickness." There is also a bar of soap for cleaning injured areas and the hands of amateur nurses, who sometimes act as midwives.

Canadian Hopes Satellites Will Aid Ice Flow Studies

MONTREAL (Canadian Press) —Using satellites to study ice movements on Canada's lakes and rivers was forecast by G. P. Williams, director of the ice and snow section of the National Research Council.

Mr. Williams noted that Canada's size made it impossible to keep study teams everywhere to check the ice. But satellites, he said, could gather both photographs and temperature data.

It is hoped that this information will enable scientists to predict the formation and breaking up of ice. The predictions would be useful to such persons as forestry workers, who use the waters to float logs, and aviators who must land on northern lakes.

23 Canadian Ships Race Freeze to Supply Arctic

By JAY WALZ
The New York Times

OTTAWA, Aug. 6 — An assorted fleet of 23 seacraft sailed from Canada's Atlantic and Pacific ports in recent days in what Canadians call Operation Arctic Supply.

The fleet includes heavy icebreakers named Wolfe and Montcalm, a "floating boarding house" called Narwhal, and converted wartime landing craft now named Auk, Puffin and Raven.

Before summer ends, these vessels will have called at scores of Arctic and subpolar ports with picturesque names such as Gjoa (pronounced Joe) Haven, Eureka, Tanquary Fjord, Povnungnituk, Sugluk and Igloolik, not to mention Frobisher, the metropolis of the Arctic, with a population of 1,600.

On this annual visit, the vessels will carry to Canada's Far North settlements, defense outposts and weather stations the supplies they will need for the nine-month freeze-up, which begins in many places in early October.

Among those supplied are about 25,000 Eskimos who find it difficult to survive the harsh winter on fish and game.

A spokesman for the Department of Transport, which operates the Arctic supply, said 106,000 tons of cargo aboard the vessels included "everything from brooms to prefab forms for houses."

Aboard the Canadian Coast Guard ship C. D. Howe, named for a late Canadian statesman, is the Eastern Arctic Patrol, making its rounds of native villages. The patrol includes doctors, technicians, administrators and Mounties.

The icebreaker Simon Fraser is bound for Hudson Strait and Hudson Bay to attend to lights and other aids to navigation along the sea route from Churchill, Manitoba, to Europe. Traffic on this route now includes freighters carrying wheat from the Canadian prairies to the Soviet Union.

The Camsell, a Coast Guard vessel that left its Victoria, British Columbia, base early in July, has skirted the coast of Alaska to shepherd cargo barges from the Mackenzie River delta to Tuktoyaktuk, Spence Bay and Gjoa Haven, all ports along the northern fringes of the Canadian mainland.

Meanwhile, ships from St. Lawrence and Atlantic ports plied channels through the labyrinth of Canada's island territories ranging as far north as Resolute Bay on Cornwallis Island. New heavy icebreakers, using information supplied by aerial survey teams, cleared the shipping lanes through Viscount Melville Sound and McClure Strait.

The Narwhal, a Coast Guard depot ship is described as a floating boarding house because stevedores live aboard while handling cargoes at major ports visited by other supply vessels.

One of this summer's special missions is a study of ice conditions in waters around Baffin Island. Government technicians are trying to determine the length of the navigable season for ships that some day will carry out the valuable minerals known to be deposited in the region.

A few days ago scientific parties from several Government departments went north aboard the Coast Guard vessels d'Iberville and Labrador on missions designed to increase knowledge of the myriad Arctic islands and waters surrounding them.

Snag Weather Post Closes

SNAG, Yukon Territory (AP) —After 23 years of producing hourly weather reports, the Transport Department's meteorological station at Snag has closed down to make way for a new station at Burwash Landing 90 miles away. Snag, on the White River 200 miles northwest of Whitehorse, made headlines Feb. 3, 1947, when it recorded a temperature of 81.4 degrees below zero.

McGILL ESTABLISHES A WEATHER STATION

MONTREAL (Canadian Press) — McGill University has established a year-round unmanned weather observation station on Axel Heiberg Island, 650 miles south of the North Pole and due north of Ottawa.

The year-old station eventually will help scientists to understand the ice age and North America's water cycle. The Arctic is held as a major source of all important water supples.

Part of McGill's arctic research program will include measuring temperature, humidity, wind velocity and direction, sunshine duration and atmospheric pressure. Data collected twice yearly, in May when the Arcitic winter ends and August when summer ends, will help establish the relationship between the climate and the region's ice masses.

"In 30 years we'll be able to talk authoritatively on the subject," Dr. Fritz Mueller of Switzerland, who is in charge of the station's operation, said recently. He is an associate professor of glaciology at McGill. The three decades will allow time to detect a pattern, or cycle, in the fluctuation between the ice and climate.

2 Survive 10 Hungry Days In Canadian Wilderness

NORMAN WELLS, Northwest Territories (Canadian Press) — For 10 days, two men who were lost in a remote area near Norman Wells, lived on food intended to last a third that time.

"We just stretched what we had," Robert McGonigal, 35 years old, said as he and Karp Gacternicht, about 50, of Dornbirn, Austria, prepared for their first hot baths and full meals in two weeks.

The men had disappeared on a 100-mile flight. Their plane was sighted upside down in a deep gully, 40 miles north of Norman Wells, 900 miles northwest of Edmonton.

Canada's Caribous Increase

EDMONTON, Alberta (AP) —The caribou population in the far north of Canada now may total between 400,000 and 500,000 animals, double the 1956-57 population, reports Dr. J. P. Kelso of the Canadian Wildlife Service. He said the increase was due to good calf crops and a relatively low human kill since 1951. In 1939 the caribou population was estimated at three million.

Canadians Try to Save Whales Trapped by Early Arctic Freeze

By JAY WALZ
The New York Times

OTTAWA, Dec. 31 — A nationwide campaign is taking shape to save 17 beluga white whales trapped in Arctic waters near the Beaufort Sea.

Rescue suggestions and offers of cooperation have poured into Ottawa and on to the far north ever since the plight of the whales was portrayed on a national television news program this week.

The whales were trapped in the Eskimo Lakes, which extend 150 miles inland from the Beaufort Sea above the Northwest Territories. An early freeze closed the neck of water connecting the lakes with the open sea. As winter progressed, ice more than two feet thick closed in, leaving the trapped whales with only one small hole from which to breathe.

Being mammals, whales must surface for air every 10 to 15 minutes. Unable to swim under water to the sea, they have crowded around the hole, measuring at one time no more than 22 square feet.

Observers in aircraft have photographed the animals milling frantically about the air space. It is feared that some whales already have died.

Power saws are being flown to the site. Heating equipment may be sent to melt the ice. An Ottawa woman has suggested pumping compressed air under the ice to provide oxygen.

Meanwhile, the Lions' Club of Inuvik, a community of Eskimos, Indians and Government workers 50 miles to the west, has organized a save-the-whales fund campaign for food and equipment to keep the animals alive until spring.

A base camp has been set up near the water hole, with tents contributed by a concern in Edmonton, Alberta, 1,500 miles to the south. A Calgary electronics concern is supplying equipment for two-way radio communications between the base camp and Inuvik and Edmonton.

P. J. Benson of the Lions' Club said additional equipment needed includes another lighting plant, two more pumps, a sizable building, two watchmen, two chain saws equipped to cut the thick ice, another tent, food and enough funds to pay the two watchmen.

Some chopped fish and meat have been dropped by plane. But tons will be required to keep the whales alive until the May thaw.

Meanwhile, rescue operations are hampered by the darkness and subzero cold that prevail in the Arctic in winter.

A federal mammalogist in Ottawa said this week that Beluga are common in northern salt water and that they have been stranded on previous occasions, either while hiding from killer whales or by ebbing tides.

Thus whales, which are hunted and slaughtered by the hundreds in the summer, have become the object of wide concern in Canada this winter.

Five Whales Sighted

INUVIK, Northwest Territories, Dec. 31 (AP)—A research team visited a hole in the ice in the waters here yesterday and reported sighting only 5 of a herd of 17 trapped beluga whales.

Members of the team said at least two year-old whales were missing. They tried to pick up sounds under the ice with a microphone and to follow the whales with a depth-finder.

OIL HUNT RESUMES ON ARCTIC ISLANDS

Companies Seek Huge Pool in Barren Land Areas

CALGARY, Alberta, July 2 (AP)—The search for oil in the Arctic islands is on again after a pause by exploration companies. Their goal: "The big one —the billion-barrel pool."

"It's there all right," says one exploration engineer. "That big or bigger. It's just a question of who finds it first and when and where."

The exploration picture to date, however, has been all dollars and no barrels.

Among major projects are a $30-million joint exploration program being considered by more than two dozen companies and a 1.1-million-acre exploration survey started by a French concern in March.

Geologists first moved into the islands in 1959. By 1964 three costly wells had been drilled, then abandoned. Then companies paused and land holdings dropped to 41 million acres, from 57 million.

New Federal exploration permits cover 63 million acres in what Dr. J. C. Sproule describes as "one of the largest, if not the largest, known untapped oil and gas basins on earth."

His company, J. C. Sproule and Associates, proposed the joint exploration group, which would hold a reported 70 per cent of the barren land now covered by permits.

Petropar Canada, Ltd., a company controlled by the French government and the largest landholder in the islands with more than 14.4 million acres, has a seismic underground mapping survey under way on Mackenzie King Island. It conducted preliminary surveys in 1964 and 1965 and plans to wrap up the present survey in mid-August.

Burmah Oil, the Great Plains Development Company of Canada and other companies sank a well near Resolute on Cornwallis Island in 1963. It ate up $1.3-million—the total budget for two wells—and then was abandoned. Transportation costs were a major fact.

Plans for formation of two new companies for the joint exploration program are under negotiation. So is a $6-million loan requested from the Federal Government for the venture.

Norwegian Resumes Digging

Helge Ingstad, an explorer, is engaged in supplementary excavations at L'Anse aux Meadows, Newfoundland, where two years ago he found remains of pre-Columbian buildings and artifacts, according to News of Norway.

Mass of Ice as Big as Manhattan Moving Down Yukon Mountain

A Huge Glacier on Mt. Steele Has Torn Loose and Is Surging 2 Feet an Hour

A mass of ice reportedly comparable in size to Manhattan Island has torn loose and begun sweeping down a glacier valley near the Alaska-Canadian border.

According to word received here July 28 from Whitehorse, in the Yukon Territory, the ice has pushed some five miles down the valley since the surge began in April.

This was reported by Walter A. Wood, president of the American Geographical Society.

"Cathedrals of ice," he said by phone, are "tottering and crashing" as the glacier overrides its lateral moraines. The latter are ridges of gravel, boulders and soil pushed up along the sides of a glacier.

The advancing ice has dammed streams flowing in from tributary valleys, forming new lakes. It has generated caverns of ice large enough to lay the Empire State Building within, "with room to spare."

The runaway glacier rises on the east flank of Mount Steele, a 16,644-foot peak on the Canadian side of the border. The glacier valley runs north and east to the Donjak River.

For several years the Ice Field Ranges Research Project, under Mr. Wood, has been studying the glaciers, climate and other features of the region.

The project is supported both by the American Geographical Society and the Arctic Institute of North America.

A "catastrophic" advance of the Steele Glacier was reported on July 21 by the project's chief pilot, Philip Upton. On Tuesday a party led by Mr. Wood reached the glacier by helicopter.

They found that previously stagnant ice was flowing down the valley at two feet an hour, overriding a bed of old, dormant ice. This is typical of such "surges," as found by both American and Soviet glaciologists.

Apparently some glaciers accumulate ice until it reaches a certain volume, whereupon a surge of ice sweeps down the valley, destroying all forests and other obstacles in its path. Such was the case with the Muldrow Glacier of Alaska in 1957 and, earlier, of the Black Rapids Glacier.

The phenomenon is presumably related to the shape of the valley or to some change that makes its floor suddenly more slippery. Mr. Wood said that careful surveys and studies were being made to explore the nature of the phenomenon.

The New York Times July 29, 1966

RUNAWAY: Steele Glacier (underlined) on east slope of Mount Steele, has begun to flow down its valley.

ARCTIC SETTLEMENT LIVES ON WELFARE

FROBISHER, Northwest Territories (Canadian Press)—Lightweight motorcycles are a common sight in Canada's Far North — the barren lands where the silence was once disturbed only by howling huskies.

Another sign of the times in this center for Federal government administration of the Eastern Arctic is the annual clean-up campaign. It has almost obliterated memories of the days when Eskimos lived in huts constructed of old Coca-Cola signs and lead-lined tea chests.

Today Frobisher's only resource is the Federal Government's pay checks and welfare allowances.

Fifteen years ago it was a jointly-occupied United States-Canadian defense communications and weather-reporting outpost.

The Eskimo settlement at that time was, to outsiders, picturesque. Blood-red sea trout with their silver skins glistening in the sun hung like socks on a clothesline to dry—sometimes intermingled, in fact, with socks, diapers, and perhaps a sealskin or two on stretchers.

Frobisher today hovers between the past and a prosperity that might still come if private industry can find any sort of economic excuse to establish itself here.

ARCTIC ICE AIRFIELDS REPORTED FEASIBLE

OTTAWA (AP)—The Canadian Defense Department, long concerned about the possible need for conducting military operations in the high Arctic, has been investigating the possibilities of using ocean and lake ice as airfields.

This was the reason for a McGill University study, which now reports that ski-equipped planes of the twin-engine DC-3 class can land safely at almost any location on "young" ice—less than one year old. Young ice is the smoothest on both lake and ocean.

"Quite large-scale operations would be possible, using prepared runways on thick young ice," the report says. Aircraft of 100 tons could be landed safely on such strips.

By contrast, ice more than a year old is extremely rough—there are scattered hummocks, some three feet high, and pressure ridges 25 feet high.

The report, by E. R. Pounder and M. P. Langleben, says no vehicle larger than a motor toboggan could traverse such ice.

Sea ice 40 inches thich will safely bear the weight of a 13-ton DC-3. Fresh-water ice is stronger and 24 inches will hold the same aircraft.

Permanent aircraft landing strips are few in the Arctic.

"Large-scale ground warfare in the Canadian Arctic regions is very improbable, on logistic grounds alone," the McGill report says. "Small-scale field operations are conceivable, however, for such purposes as defense against submarine intrusion."

Only One Recruit Is Found For Anglican Arctic Posts

TORONTO (Religious News Service)—The Right Rev. Donald B. Marsh, Anglican Bishop of the Arctic, returned to his headquarters here from a priest-recruiting campaign in Britain with only one name on his list—that of a 28-year-old clergyman who expressed an interest in Canada's north.

The slim pickings came after a six-week tour in which Bishop Marsh made speeches at a one-a-day clip and was heard by more than 2,000 seminary students and priests.

The 67-year-old Bishop, who has his office here, has spent more than 40 years serving his massive diocese, said there are 20 Anglican mission stations in the 2,500,000 square miles that stretch from Yukon to Labrador. Twenty-two priests serve the area. Bishop Marsh has his diocesan office here, but visits his Eskimos every year.

Canada Plans '67 Series

By DAVID LIDMAN

The New York Times

CANADA in 1967 will replace her current definitive stamps with a new 12-stamp series, five of which will include a new portrait of Queen Elizabeth II of Britain. Each stamp will depict Canadian scenes. The seven higher denominations, without the Queen's portrait, will bear other portraits by well-known Canadian artists.

Postmaster General Jean-Pierre Côté, in announcing the new definitive series, also stated that eight commemorative issues would appear in 1967, as well as a souvenir box for Canada's centennial. The box will contain the 12 definitive stamps in its lid.

Scenes on the lower denominations, incorporating a portrait of the Queen by Anthony Buckley of London, will be as follows: 1c, the Northwest area, including aurora borealis and dog-sled team; 2c, Pacific Coast area, including totem pole; 3c, prairie scene; 4c, St. Lawrence Seaway lock; 5c, Atlantic Ocean area, a fishing community harbor.

In each design, the Queen's portrait appears at the right. These five stamps will be printed by the Canadian Bank Note Company, Ottawa.

The 8c to $1 denominations will reproduce paintings by Canadian artists. These scenes from the National Gallery, Ottawa, are as follows: 8c, "Alaska Highway Between Watson Lake and Nelson," by A. Y. Jackson; 10c, "The Jack Pine," by Tom Thomson; 15c, "Bylot Island," showing a glacier, by Lawren Harris; 20c, "The Ferry, Quebec," by James Wilson Morrice; 25c, "The Solemn Land," a mountain and river, by J. E. H. MacDonald; 50c, "Summer's Stores," a granary, by John Ensor, and $1, "Imp. Wildcat No. 3 Excelsior Field Nr. Edmonton," an oil-well operation, by H. G. Clyde.

ARGENTINA. Multicolored stamp publicizes "Antarctic Expedition".

Set Of Ten For Antarctic Area

Australian Postmaster General Alan Hulme has announced that ten new Australian Antarctic Territory stamps will be issued September 28. All ten were designed by John Mason of Melbourne and were illustrative of the important scientific research which Australians were carrying out in the Antarctic region.

The stamps were multicolor photogravure printed by the Note Printing Branch of the Reserve Bank of Australia. Values and designs are:

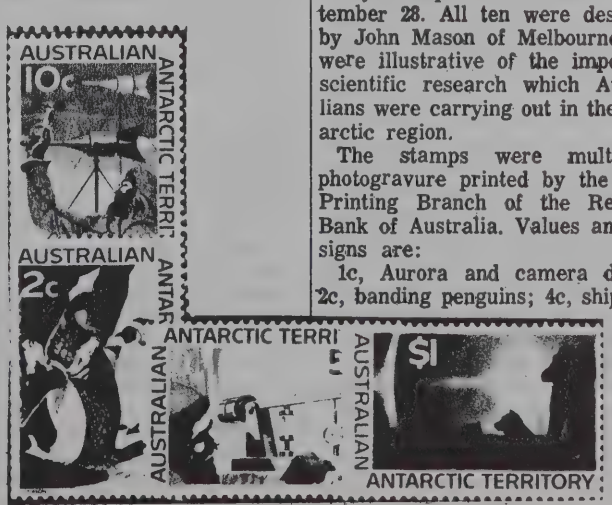
1c, Aurora and camera dome; 2c, banding penguins; 4c, ship and iceberg; 7c, measuring snow layers; 10c, wind gauges.

Also, 15c, weather balloon; 20c, helicopter; 25c, radio communication; 50c, ice compression tests; and $1, parahelion ("mock sun").

The 1c to 5c inclusive are of vertical format and the remainder horizontal.

Mr. Hulme said that the new stamps are intended for use in Australian Antarctic Territory and at Macquarie Island and will not be placed on sale at post offices in Australia. However, arrangements had been made to enable collectors to purchase the stamps at the Department's philatelic sales sections as from September 28.

He added that the new stamps will be conveyed to post offices at Mawson, Wilkes and Macquarie Island by the ships carrying the 1966/67 relief parties which are expected to leave Australia late this year.



Belgian Charity Trio And Sheet Note Antarctic Work

A semipostal set of three stamps plus a souvenir sheet was issued by Belgium on October 10 featuring Antarctic exploration conducted by Belgian figures, and carrying a surtax to be devoted to the work in that area.

Values are 1 franc plus 50c, emerald green; 3fr. plus 1.50fr., violet; 6fr. plus 3fr., red ocher; and 10fr. plus 5fr. souvenir sheet, gray, red, blue, and black.

The designs show various Antarctic scenes, with a Belgian explorer on the middle value. He is Commandant Adrien de Gerlache who led the highly successful Antarctic expedition of 1897-99.

Designs were by Bonnevalle (middle value) and H. Verbaere, with engraving by, in order, Schotte, de Vos, Verheyden, and Janssens.

The souvenir sheet features a map of the polar area with an explorer and tower house at the lower left and the actual stamp at the upper right. It shows the ship "Magga Dan" with a penguin and her three chicks.

GREENLAND. Single stamp illustrates motif from legend "The Boy and the Fox".

Venture Into the Unknown

WHERE THE SEA BREAKS ITS BACK. By Corey Ford. Drawings by Lois Darling. 206 pp. Boston: Little, Brown & Co. $5.95.

By JEANNETTE MIRSKY

IN the history of maritime discovery, few voyages can match the obstacles, hardships and success of Bering's Second Expedition in 1741, that initial crossing of the North Pacific. (It was as though Lewis and Clark had gone overland to the Pacific to build ships in which to sail in search of a still-unknown but rumored Japan.) Even more treacherous than the court and scientific intrigues bedeviling them from St. Petersburg more than 5,000 miles away, and more hazardous than the theories about the geographical relationship of Asia and America, the expedition endured the nightmarish reality of the actual voyage. The waters that separate Siberia and Alaska are strewn with innumerable volcanic islands and half-submerged rocks. Fair weather is a rarity—it is a region of obliterating fogs, driving rains and murderous winds. The williwaw is the satanic majesty of tempests.

"Where the Sea Breaks Its Back"—the title is a translation of the Aleut name for Alaska—tells the heroic and tragic story of that momentous expedition. The book's hero is not Vitus Bering, the commander who built well, suffered much and died at the moment before success, but Georg Wilhelm Steller, the brilliant German-born scientist, naturalist, botanist and physician who accompanied Bering.

STELLER knew the unique opportunity the expedition offered to a man of his training and talents. He would walk on land never before seen by any European, and he would be able to observe the flora and fauna of a wholly unknown region. "Where the Sea Breaks Its Back" tells not only how a magnificent naturalist responded to this high enterprise. It also relates how Steller mobilized and applied his botanical knowledge to bring relief to the scurvy-ridden crew during their winter's ordeal on Bering Island and describes his warm humanity in tending the sick and dying. As a scientist, Steller stood alone and apart, walking arrogantly, blazing with contempt for the stupidity he saw; only as a physician could he come close to his fellowmen.

Corey Ford, the author previously of "A Peculiar Service" and other books, is also a naturalist and has spent much time in the Aleutians. He skillfully unfolds Steller's complex, contradictory nature and the significance of the events in which he figured. Basing his story on Steller's journals and other relevant material, Ford writes with authority and clarity, grace and truth. We come to understand the quality of Steller's work, his driving curiosity and acute observations. For good measure, the author notes some of the aftermath: the ruthless exploitation of immense herds of marine mammals, wiping out rich sources of furry wealth and food; also the fairly recent protection of the sea otter and seal that is restoring their numbers and economic potential.

Steller's life was short—he died at 37. His marriage was brief and bitter; his last years were filled with disillusion and empty of friends. Yet his victories were extraordinary. As Frank Dufresne, former director of the Alaska Game Commission, writes in his introduction, "he discovered the Steller's jay, the Steller's eider, the rare Steller's eagle, and the now legendary Steller's white raven. Turning to the ocean, he found and recorded the Steller's greenling, our brilliantly colored rock trout. His is the only description of the giant northern manatee called Steller's sea cow, which became totally extinct shortly afterward. Stranger still is his detailed report of a creature never again seen by man: Steller's sea monkey, which lives only in this young German's vivid field notes. Steller's Hill on Kayak Island, Steller's Mountain and Steller's Arch are visible monuments to the first white man ever to set foot in Northwest America, the first naturalist to describe the flora and fauna of the new world."

"Where the Sea Breaks Its Back" should have a wide audience. It will appeal to those who enjoy well-written, informed books on natural history, to those who in this coming Alaskan Centennial Year will want to know why and how the Russians crossed the North Pacific and discovered Alaska, to the ardent conservationists who here will find tragic documentation of their warnings, and, finally, to all who want a true story well told.

THE NEW YORK TIMES BOOK REVIEW

MISS MIRSKY wrote "Elisha Kent Kane and the Seafaring Frontier" and "Great Chinese Travelers."

ANTARCTICA: The Worst Place in the World. By Allyn Baum. Illustrated. 151 pp. New York: The Macmillan Company. $3.95.

THE FORGOTTEN VOYAGE OF CHARLES WILKES. By William Bixby. Illustrated by John Flynn. 184 pp. New York: David McKay Company. $4.

MR. ARCTIC. By Erick Berry. Illustrated. 185 pp. New York: David McKay Company. $4.50.

For Ages 11 to 16.

THE POLAR REGIONS. By Irving Robbin. Illustrated by Shannon Stirnweis. 48 pp. New York: Grosset & Dunlap. $1; paper, 50 cents.

MATTHEW HENSON: Arctic Hero. By Sheldon N. Ripley. Illustrated by E. Harper Johnson. 191 pp. Boston: Houghton Mifflin Company. $2.20.

For Ages 8 to 11.

By EDWARD B. GARSIDE

ALL of these books about the world's polar regions are for young people, though at least one will also appeal to adults as a fine piece of reporting. That one is Allyn Baum's "Antarctica," a description of the Southern Continent covering both its early exploration and the current international effort by an army of scientists to assess this most hostile of environments.

Mr. Baum, a special writer and photographer with The New York Times, has twice visited Antarctica with American expeditions. His firsthand experience gives him a great advantage in getting across a clear idea of the enormous logistic and physical problems of modern polar research. The Antarctic night lasts six months, winds of hurricane force are common and temperatures have been known to drop to —113° F. Here sound nerves are of the essence. Mr. Baum leaves a powerful impression of vastly mountainous spaces sealed beneath an ice-cover in places a mile and a half thick, a congealment so immense that were it to melt the oceans of the world would rise 200 feet and drown all coastal settlement.

An early visitor to the icy margins of this forbidding continent gets belated recognition by William Bixby in "The Forgotten Voyage of Charles Wilkes." In 1838, Wilkes, a lieutenant in the American Navy, led out a four-year expedition to explore the seas and distant places of the world, including South Polar seas far below the Horn. The six little vessels of Wilkes's squadron were nailsick and crank even as they pulled away from Hampton Roads. Yet somehow he brought most of them home, after surveying 280 islands, compiling 180 charts, some still good to this day, and proving, to his own if no one else's satisfaction, that Antarctica is indeed a continent. Wilkes had an arrogant manner and a doctrinaire mind which, Mr. Bixby tells us, gained him many enemies. On this account, and also because some of his observations had been distorted by typical south polar mirage effects, Wilkes's achievements were ignored and he even suffered the ignominy of a court-martial. This is a workmanlike condensation of what must have been a bewilderingly large and scattered body of fact.

With Erick Berry's "Mr. Arctic," a biographical sketch of Vilhjalmur Stefansson, the scene shifts to the Arctic, the Eskimos and the heroic period of exploration and adventure in the Far North. Miss Berry reminds us that Stefansson was born in Canada of Icelandic immigrant parents who, when he was a child, moved down across the border to the Dakota Territory. She makes much of his self-education and of his natural affinity for cold places and the people indigenous to them. It is not easy, at far remove, to suggest the requirements of sleeping out in blizzards, dining on blubber for weeks on end and happily chatting with Eskimos in igloo confines, but Miss Berry makes a determined and reasonably successful effort.

In Irving Robbin's "The Polar Regions," an addition to the How and Why Wonder Book series, the young reader is offered a general survey, in simple language, of both the Arctic and Antarctica, so presented as to make clear the great differences between these two refrigerated zones. The book follows a format in which Mr. Robbin's text serves as an extended caption to freely rendered drawings by Shannon Stirnweis but a good deal of information is pleasantly conveyed.

Finally, in Sheldon Ripley's "Matthew Henson," the Negro who went with Peary to the North Pole, an ill-remembered American figure of heroic mold, is sympathetically portrayed. The racial downgrading that even a personality as strong and steady as Henson could never overcome is quietly deplored by Mr. Ripley. Thus moral suasion is combined with an account of courage in this volume in the Piper Books series.

THE NEW YORK TIMES BOOK REVIEW

Oct. 12

Life Among Eskimos

Life on Little Diomede, an island in Bering Strait, is the subject of "Two On the Rocks" which McKay will issue on Monday. The author, Gerald Carlson, describes how he and his wife taught the Eskimo children of the island for a year. The couple had to practice medicine, act as domestic court judges and be hosts at the Thanksgiving feast of stewed walrus.

Call of the Wild

MY WAY WAS NORTH. An Alaskan Autobiography. By Frank Dufresne. Illustrated. 274 pp. New York: Holt, Rinehart & Winston. $5.95.

By ERNEST GRUENING

THIS is a thrilling narrative. It is also one of the most important and valuable books ever to come out of the great American North. New Hampshire-born Frank Dufresne, after two years in the shellholes of World War I, in his mid-twenties, traveled across our country, and with no real purpose in mind brought a round-trip ticket from Seattle to Nome. En route at the whaling station on the isle of Akutan, he was induced by the scientist in charge to step into and examine a blue whale's cavernous mouth, a rare experience which presaged a career of "watching and watching over wild animals."

An incidental purpose of Dufresne's journey was to locate an uncle who had gone north in the Klondike gold rush and had not been heard from since. Dufresne found Uncle Charley: he was mayor of Nome. Having lost none of his gold fever—a well-known Alaskan proclivity—he sought to infect his nephew with it. Frank was, however, fascinated with the resource "that had wings and fins and hair on it" and gave up his return ticket.

His ability to operate a typewriter brought him the job of Deputy Marshal of the Second Judicial Division, the Eskimo-inhabited area along the Arctic and Bering Seas. An article on its wildlife accepted by a small Eastern magazine brought him to the attention of Dr. E. W. Nelson, that great scientist, first head of the Bureau of the Biological Survey in Washington, who decades earlier had been a pioneer student of the zoology and anthropology of Northwestern Alaska—and now longed to have his earlier research updated. So began Dufresne's career as the Bureau's field agent, starting with an investigation of "reindeer land," the vast tundra where small shipments of domesticated reindeer, brought in from Lapland and Siberia in the 1890's, had multiplied to half-a-million.

Plans were afoot at the time to alter the bucks, to produce "rennon" beef for sale in the states. The new investigator's tour of duty was climaxed by a wrestle with one such animal, in an improvised corral:

"I went forward to meet what must have been the biggest and maddest bull in all the churning thousands," he writes. "I seized his left antler confidently, and I remember how soft the coating of summer velvet was in my hands. There wasn't much else to remember. For a moment, I stood eyeball to eyeball with this bulging-orbed demon, then he flung me over his shoulder, flailed me around in the air, and sent me flying into the fence. I managed to sit up in time to wave good-bye as he fled across the tundra to his freedom. I didn't blame him a bit. I hoped he would live to sire a thousand sons."

Dufresne spent five years in Nome, five in Fairbanks. For the next decade, he was the Bureau's Alaska chief, with headquarters in the territorial capital at Juneau. His tours of duty took him to the Aleutians, to Hooper Bay and the Yukon delta, on dog-sled trips in sub-zero blizzards, to Indian fisheries. In those 20 years, he came to know more about Alaska's superabundant wildlife than any other member of the two-legged species. He was convinced that, "while the Alaska hinterlands had been explored for gold," the true wealth of the peninsula lay in "its fur and game and fishes—renewable assets that could be managed to yield an annual harvest of considerably more value." With this end in view, he drafted the Territory's first game law, and supervised its operation.

"My Way Was North" is a brilliant account of these living resources of air, land and water, against a background of towering snow-clad peaks, virgin forests, rampaging rivers, flaming auroras and midnight sun. The story is spiced with exciting adventures; it includes much about the primitive inhabitants, whose right to utilize these animal resources for their needs, conservation practices notwithstanding, the author defends.

The narrative ends in the early 1940's, when Dufresne was induced to become publicity director of the new Federal Fish and Wildlife Service, U.S. Department of the Interior, under a reorganization plan which combined the former Bureau of Commercial Fisheries, of the Department of Commerce, and the Bureau of Biological Survey, of the Department of Agriculture. After he left his beloved Alaska, he continued to write books and magazine articles, and battled for the conservation principles he had espoused. His recent book, "No Room for Bears," brought him into conflict with policies of the Forest Service in its management of Admiralty Island in Southeastern Alaska's Tongass National Forest—and raised the controversy inherent in what he deemed the issue between timber utilization and ursine preservation.

Frank Dufresne has both written and made important history in Alaska. He has set it down in a valedictory that belongs in the library of every lover of the great outdoors. It is a pity that he died last spring, too soon to enjoy the tributes this fascinating account of a fruitful and dedicated life should and will receive. The book is enhanced by excellent drawings of Alaskan wildlife by Rachel Horne.

MR. GRUENING is a United States Senator from Alaska.

THE NEW YORK TIMES BOOK REVIEW

Dr. Tedrow Writes Book On Soils of Antarctica

Nov. 13

"Antarctic Soils and Soil-Forming Processes" is the topic of Dr. John C. F. Tedrow's latest contribution to knowledge of Antarctica. The 177-page book which he edited for the American Geophysical Union was off the press this week. Dr. Tedrow is professor of soils at Rutgers College of Agriculture and Environmental Science.

Dr. Tedrow has been on the Rutgers staff for close to 20 years and has been interested in soils of the Arctic and Antarctic for nearly all of that time. He has made about 15 trips to the Arctic and he made his first trip to Antarctica druing 1961-62.

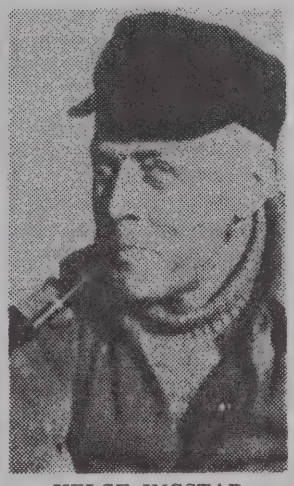
Dr. Tedrow says that whatever the mission, getting to this vast continent is half the battle. Scientists first go to Christ Church, New Zealand, then wait until some pilot is willing to fly them the next 2,000 more miles to Antarctica where they set up camp in below freezing weather.

The book is published in connection with the International Geophysical Year. This is the eighth of a series of books on the area published by The American Geophysical Union through a grant from the National Science Foundation.

LAND UNDER THE POLE STAR. A Voyage to the Norse Settlements of Greenland and the Saga of the People That Vanished. By Helge Instad. 381 pp. St. Martin's Press. $10.

It's high time, the explorer-author holds, that systematic attempts be made to find factual evidence that Norse Greenlanders voyaged to Newport, R.I., and other points on the North American Continent (which they called Vinland) in the early years of the 11th Century, some 450 years before Columbus discovered America in 1492.

His current book, however, to which he is writing a sequel about Newfoundland, deals mainly with Eirik the Red and the last of the Vikings of Norway who populated Greenland for 500 years after 1,000 A.D.



HELGE INGSTAD

and then mysteriously disappeared, leaving their livestock running wild. Only Eskimos remained on Greenland, the world's largest island.

But what caused the disappearance of the sturdy Norsemen from Greenland? The author speculates that it was a combination of circumstances—changing political, economic and religious influences in Europe, plagues, piratical raids and encroachment of the Eskimos, all of which may have caused the surviving Norse Greenlanders to emigrate.

One thing is certain. They didn't intermarry much with the Eskimos. Skeletons from their church graveyards show they preserved their Norse characteristics to the end. They played chess while alive and were buried in European cut clothes when they died.

The book is translated from the Norwegian and is well documented by the author. He includes a bibliography, index and numerous maps and photographs.

Greenland Called the Best Site To Detect Underground Blast

Mile-Thick Ice May Be the Most Silent and Sensitive Seismic Base on Earth

By WALTER SULLIVAN
The New York Times

Experiments carried out on the central crown of the Greenland ice cap indicate that this may be the most sensitive place in the world for feeling the seismic pulse of the earth and detecting underground nuclear explosions.

The ice, more than a mile thick, is so free from the noise of local tremors that seismic instruments set in deep holes there are extraordinarily sensitive to distant disturbances.

The detection of tremors produced by nuclear explosions, and their distinction from natural quakes, is central to the problem of achieving a complete ban on atomic bomb tests. To date the ban agreed to by the United States, the Soviet Union and others—but not by France and Communist China—has applied only to shots fired in space and in the atmosphere.

These can be clearly detected. But some scientists have contended that an ingenious cheater could test weapons underground without the knowledge of outsiders.

A few years ago it was suspected that the floor of the ocean might be so quiet as to be an ideal area for monitoring quakes and explosions.

Instrument packages were developed that can be thrown overboard. They sink to the bottom, record tremors for a period, then release ballast and pop to the surface for recovery and analysis of their recordings.

It was an American proposal, made privately to the Soviet Union, for such monitoring off the Kurile Islands that led to a negative Soviet response a few days ago.

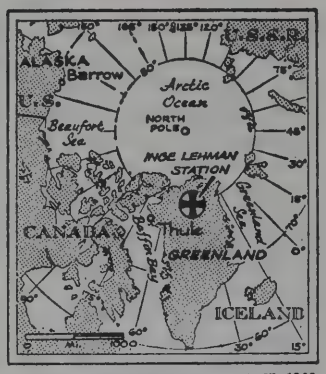
The Kuriles are a frequent source of natural quakes and have been spoken of as a logical site at which Soviet bombs might be tested without detection.

However the ocean floor observations have been disappointing. The ocean generates its own background noise.

Another proposal for attacking the noise problem was to make observations at a network of stations, all linked to a central computing center.

By staggering the inputs from these stations it is possible to augment the signal produced by a distant event and cancel out much of the local noise.

This is possible because a seismic wave from such an event hits the various seismic stations in a sequence that can be recognized by the computer. The noise hits the instruments at random and can be eliminated.



The New York Times Sept. 27, 1966

Site of station monitoring quakes is shown by cross.

The most abitious application of this principle is LASA—the Large Aperture Seismic Array in Montana.

It was built by the Lincoln Laboratory of the Massachusetts Institute of Technology for the Advanced Research Projects Agency of the Department of Defense.

LASA spans 120 miles and comprises seismographs set in 525 holes 200 or more feet in depth. It has led to dramatic gains in detection, analysis and location of distant seismic events.

Some seismologists, however, thought even greater sensitivity could be achieved in the center of north Greenland. They reasoned that even the most remote part of Montana is shaken by manmade and natural events—rail and truck traffic, quarry blasts, earthquakes to the west, and so forth.

In Greenland the flow of ice towards the sea is most rapid in the glaciers that snake through the coastal mountains. There the grinding of ice against rocks must produce much seismic noise. It was assumed that at the center of the ice sheet—the area from which ice flow radiates in all directions—the rate of flow and hence the noise would be minimal.

Hence a small station was built on that site, 400 miles east of Thule. Four holes have been drilled 200 feet to reach hard blue ice—hence the name of the study: the Blue Ice Project. The camp was dedicated Aug. 19 as "Station Inge Lehman," underlining its Danish-American sponsorship.

Dr. Inge Lehman, a Danish woman, made important contributions to seismic theory.

Since Greenland is Danish territory, the project is being carried out jointly to avoid diplomatic complications.

The American participant is the Arctic Institute of North America, a Canadian-American institution. The Danes are represented by the Geodetic Institute and the Arctic Institute of Denmark. The project is financed by the Pentagon.

Preliminary reports from the station indicate that the noise level there is 60 to 70 per cent lower than the level on the North American mainland — even at sites as quiet as Montana.

Hence preparations are being made to fly in a new team of four men to be assigned to the little station all winter.

The project leader is Ralph Lenton, who took part in the crossing of Antarctica led by Sir Vivian Fuchs in 1957-58. However Mr. Lenton will not spend the winter at the station.

A technician, Lane Churchman, of Teledyne Industries in Garland, Tex., will operate the equipment. Dr. Edward Douze, chief seismologist of the company, said yesterday that the very low level of background noise suggested that the ice sheet — some 8,000 feet thick — is flowing smoothly over the land.

It has been proposed that the ice, at that depth, is almost in a molten state.

North Pole trek set by snowmobile team

ST. PAUL, Minn. Dec. 19 (AP)

Eight amateur explorers have plans to cross the arctic ice from Canada to the North Pole—by snowmobile.

They say it will be the first ice crossing to the pole since Admiral Robert E. Peary did it in 1909 for the first time.

"We believe that modern technology has developed the fields of transportation, clothing, food, and communication equipment, which will make feasible an expedition across the north polar ice cap," said Ralph S. Plaisted, a 39-year old White Bear Lake insurance man and leader of the expedition.

"It's an adventure; it involves a first," he told a press conference.

Mr. Plaisted says the expedition will begin March 18 and will take about three weeks to reach the pole from Eureka, Ellsmere Island, in Canada's Northwest Territory.

Snowmobiles, each able to pull 500 pounds and travel at 25 to 30 miles an hour, are to replace the dogsleds Peary used for the trek.

Nevertheless, the party expects temperatures as low as 65 below zero and winds up to 60 miles an hour.

Mr. Plaisted said the expedition has had cooperation from United States and Canadian Governments.

Six Minnesotans, a New Yorker, and a Canadian will be members of the expedition.

The members include Robert Clemens, a camerman for the Columbia Broadcasting System, New York, and John Austad, a senior survival and rescue instructor and member of the Royal Canadian Air Force.

Mountains on Ocean Floor Around Aleutians Revealed

WASHINGTON, Dec. 26 (UPI) —The existence of dozens of previously unchartered undersea mountains, ridges and basins was disclosed today with the publication of six new maps of the ocean floor surrounding the Aleutian Islands.

The maps cover 400,000 square miles of sea bed in a North Pacific and Bering Sea region where thousands of earthquakes occur every year. The newly discovered mountains rise as high as 6,510 feet from the ocean floor.

The Environmental Science Services Administration in the Department of Commerce, which published the maps, said they were expected to provide "a much better understanding of the geologic forces which shape the ocean floor in this seismically active area."

Soviet Sends Ice to Arctic

MOSCOW, Aug. 22 (UPI)— Tass, the Soviet press agency, said dry ice was being sent to the Arctic town of Igarka, where the ground, supposedly frozen permanently the year around, actually is too soft to support buildings. The dry ice is packed around hollowed-out piles that are driven into the ground as foundations for houses.

Famed Ice Island Going

Floating Base for Scientists to Be Replaced

WASHINGTON Aug. 20 (UPI) They're trying, these modern technologists, to make old T-3 Obsolete.

The sad thing about it is that nobody seems sad about it. It's all for the advancement of science. Who can get sentimental about a big chunk of ice?

That's what T-3 is, an ice island 2 1-2 miles wide, six miles long, and 60 to 80 feet thick, which for decades has been drifting shiftlessly around the Arctic Ocean.

For a dozen years it has served as a natural floating base for scientists who have lived, worked and suffered aboard it.

Now the National Science Foundation (NSF) proposes to replace or supplement T-3 with something which, being man-made, presumably will be a lot better.

The NSF recently awarded three contracts, totaling about $111,000, for "conceptual designs" of an artificial drifting island with which to continue Arctic researches, so hardily conducted by scientists on T-3 and other slowly moving bases supplied by nature.

The new Arctic lab will be a sort of barge which, by reasons of shape and structural strength, will be able to survive the immense crushing forces of pack ice.

It will have living and working space for about 45 scientists and crew members, compared to T-3's present complement of 24 men. It will carry food and fuel "for several years." Its facilities will include scientific laboratories, shops, heavy deep sea winches, a helicopter pad, radar and a hangar for small airplanes.

Power for its lights and internal housekeeping and scientific operations may be supplied by a nuclear reactor.

What veterans of duty tours aboard T-3 may find hard to believe is the further fact that the artificial island also will have a hospital.

A hospital! T-3 doesn't even have a doctor aboard. If anybody breaks an arm or gets sick on T-3 a little rescue plane from the Arctic research laboratory at Point Barrow, Alaska, comes after him.

It does, that is, if radio communication between the big slab of ice and the mainland hasn't been blacked out by a solar magnetic storm, a frequent occurrence at the poles. There have been several emergency evacuations of personnel from T-3. One man died on the island before help came. The Point Barrow lab is operated by the University of Alaska for the Office of Naval Research.

According to W.I. Wittman, head of the Sea Ice Research Project of the Naval Oceangraphic Office, scientists aboard T-3, civilians all, have had to be brawny as well as brainy.

They have had to be young enough and strong enough to help keep runways clear, set up "prefab" huts, and perform many other rough chores, along with their scientific labors, under hardship conditions.

The Arctic Ocean is a fine place for study of marine biology, chemistry, physics, sea-air weather relationships, glaciology and what goes on in the upper atmosphere as a result of solar particle bombardment.

The Russians have been manning Arctic ice islands since 1938. T-3 has been manned more or less steadily by Americans, first under Air Force and then under Navy auspices, for 12 years.

Americans have manned other ice islands, notably Arlis 2, which was first sighted in May, 1961, about 100 miles north of the northeasternmost point of Alaska. This island was relatively small, about two miles by one, and about 80 feet thick.

It was manned a month after discovery and abandoned four years later—just 20 days before it began to break up after being caught in currents that carried its fragments down the east coast of Greenland into the Atlantic

T-3 so far has been in a more stable drift pattern. In the years it has been under observation it has made two complete circles of the Arctic's Canadian basin without getting trapped in the currents.

The Arctic is important not only scientifically but also strategically. At least four U.S. atom-powered submarines have voyaged under the Arctic ice by way of the North Pole, and Russia is believed to have nuclear subs capable of doing the same.

T-3 has received visitors from the USS Seadragon, which sailed under the Arctic ice in partnership with another atomic submarine, The Skate, in 1962.

The plan is to tow the artificial island through the Bering Straits into the Chukchi Sea, between Russia and Alaska, and turn it loose in the Arctic ice pack. It then will drift north toward the pole and then through the Greenland Sea or go into a clockwise circle carrying it down toward Canada. The hope is to set it adrift in the early 1970s.

Satellite to Stalk Northern Lights

STOCKHOLM, Sweden — The mysteries of the "northern lights," made famous in poetry and prose, may soon be stripped away with scientific precision by a new satellite experiment, it was announced here today by a subsidiary of International Telephone and Telegraph Corp.

According to Frank A. Hammar, managing director of Standard Radio and Telefon, his type of electronic apparatus that will be lofted in a European satellite to measure the direction of travel and the speed of the electronic particles that are thought to cause the northern lights, or aurora borealis.

Scientists say that these high-speed particles, coming from the depths of outer space, collide with atoms of the atmosphere at great heights, causing the atoms to glow visibly as the northern lights.

Auroral Probe Scheduled

HOUSTON, Dec. 31 (UPI)— The second of two rocket probes to investigate the northern auroral lights will be launched in February at Fort Churchill, Canada, by Rice University scientists. They hope they will be able to determine how the particles that cause auroral lights are energized and transported.

NORTHERNMOST LAND

Northernmost land in the world is Cape Morris Jesup; in the northeastern extremity of Greenland, about 440 miles from the north pole.

ICEBREAKER CIRCLES ISLAND IN THE ARCTIC

VANCOUVER, B. C. (Canadian Press)—The Canadian Coast Guard icebreaker Camsell is back after making history in the Arctic Ocean. The Camsell, which docked recently at her home port of Victoria, became the first vessel this summer to circumnavigate King William Island in the Western Arctic.

It was at the north end of the island, near Cape Felix, that two ships of the Franklin expedition in 1945 became caught in ice. The crews left the ships to go south and were never found.

The Camsell's skipper, Capt. John Strand, said in an interview he regarded the circumnavigation as "a pretty routine trip," adding that the only reason his ship sailed around King William Island was that the waters were free of ice for the first time in eight years.

Captain Strand said his ship had put in at a few isolated points but had found no sign of the Franklin expedition.

Artificial Snow Aids Attempt To Build Snowproof Building

WEST LONG BEACH, N.J. (UPI) — A computer company is creating snow to help the Army's Cold Regions Laboratory in Hanover, N.H., learn how to keep its cold weather outposts from being engulfed by heavy snowfalls.

The artificial snow, made by Electronic Associates, Inc., is not the snowflake of the American winter, but the spherical snow pellets that fall in the frigid zones. Since melting is impossible in the extreme cold of these regions, accumulations of snow eventually engulf buildings and equipment.

The analog computer's job is to recreate mathematically the behavior pattern of this snow so that buildings can be designed to prevent snow entrapment.

Astronauts Plan Alaska Test

ANCHORAGE, Alaska, Aug. 3 (AP)—A group of 39 astronauts, geologists and other scientists from the Houston Space Center will spend a week in the Valley of 10,000 Smokes as part of training for moon explorations. A similar visit to the area was made by astronauts in July, 1965. The region is considered a valuable geologic training ground for the men who one day will collect samples on the surface of the moon.

Arctic Wet Despite Little Rain

Little rain falls in the Arctic area, but its soil stays wet because drainage is poor and evaporation slow, the National Geographic says.

Reprinted from "U.S. News & World Report," published at Washington.

AS THE MODERN WORLD COMES TO GREENLAND—

The raw, frigid frontier is being pushed back in Greenland—a part of Denmark that is a key in U. S. air defense. Modern times are coming to the island. Richard K. Brome, "U. S. News & World Report" staff member, traveled to the rim of the Arctic Circle for a close-up of an ancient Viking land now in transformation.

Street scene in Godthaab, Greenland

GODTHAAB, Greenland

Drop from the sky into one of Greenland's isolated towns, and you find yourself in a strange world of contrasts.

On a bright afternoon in early autumn, I sat in a sunny garden, drinking tea with the principal of Greenland's only high school and his wife. There were bright flowers, and the small lawn was thick and green.

Not far away, outside the harbor entrance, a giant iceberg drifted by.

There are other reminders aplenty that you are in Greenland, close to the Arctic Circle, with contradictions and problems all about you.

For instance, a cosmopolitan array of drinks is available at the Godthaab Hotel. The dining room opens at eight, and its dozen tables are nearly always reserved in advance. A maitre d'hotel presides. The choice of menu is wide.

But the hotel has no flush toilets. And if you stay on after the music and dancing starts, you may see a fight between two Greenland youths or Danish construction workers, as might happen in any raw frontier town anyplace.

Water problem. Godthaab does have one water main and one sewer line, serving a large part of the town. But, in spite of myriad glaciers and snow-fed lakes, the engineering problems posed by the rugged, bare, rocky terrain and the Arctic temperature limit freshwater supplies.

Variety as well as contrast contribute to the surprises in Greenland.

In Julianehaab, old Europe shows through. A town founded in 1775, it has a fountain and a town square that are reminiscent of illustrations of Hans Christian Andersen's fairy tales.

Kutdligssat, on the west shore of Disko Island, is a coal-mining town.

In Egedesminde, Greenland's second-largest community, packs of evil-looking Eskimo dogs roam the streets and prowl the waterfront in search of food. In the North, each family keeps as many packs of dogs as needed for its sleds. The dogs are fed in winter, but left to forage when the snow is gone.

—USN&WR Photos

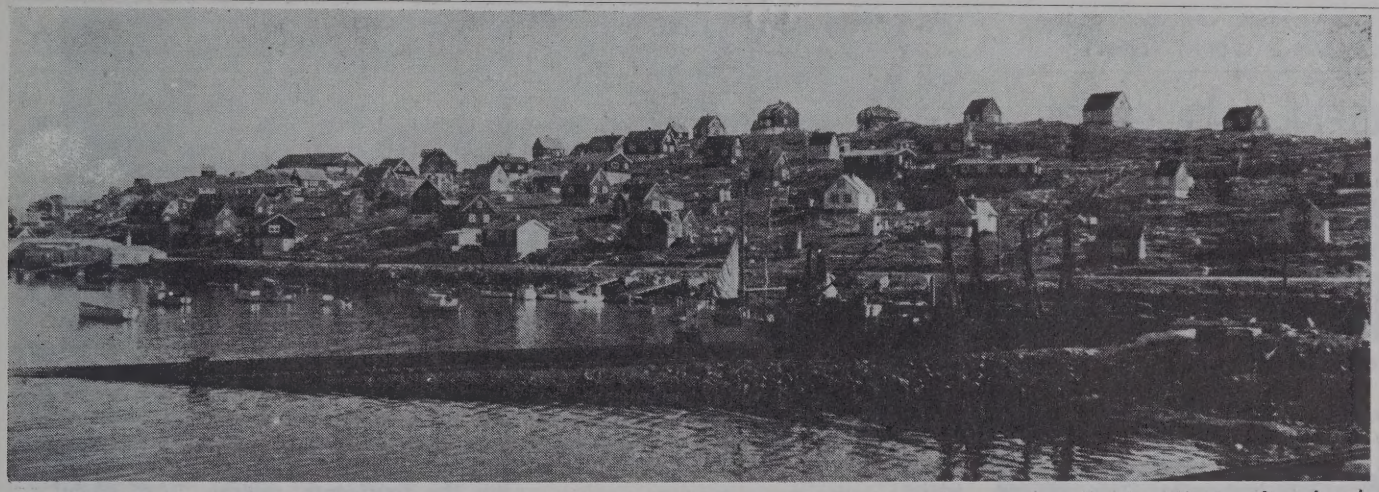
FORBIDDING TERRAIN of Greenland, as seen from a helicopter. The country is so mountainous that there are only five level airstrips. Highways are nonexistent.

These aspects of Arctic life do not mask the fact that the comforts of civilization, partially subsidized by Denmark, are coming to Southwest Greenland. It is the towns that are changing markedly.

These changes are of interest to the U. S. There are Americans here, manning vital air-defense posts for the U.S. Five hundred Air Force personnel are stationed on the base at Sondre Stromfjord, and another 1,700 are on duty at Thule, far to the north.

In addition, American servicemen staff four Distant Early Warning—DEW Line—stations strung across Greenland. Even

"HIGH-RISE" apartment house in Godthaab. It is country's biggest building.



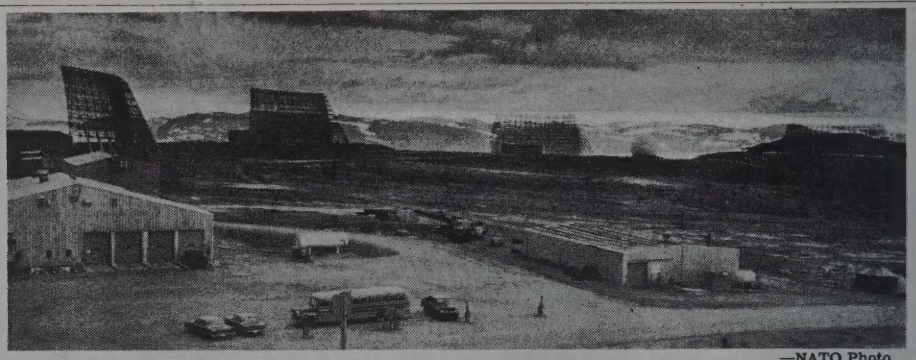
EGEDESMINDE is one of Greenland's port communities. Buildings show European influence, but frontier life is often harsh.

FISH MARKET at waterfront in Julianehaab. Big hauls are taken off Greenland banks, and processing plants are a booming business.

SUPERMARKET in Godthaab has a variety of goods that compares favorably with selection in small U. S. towns.

U. S. News & World Report

GREENLAND GOES MODERN



—NATO Photo

THULE, IN NORTHERN GREENLAND, is a vital U. S. air-defense base where 1,700 men of U. S. armed forces are stationed. They guard against missile attacks.

so, one rarely sees an American. U. S. military authorities are wary about letting their servicemen use their leave to visit Greenland communities.

The Royal Denmark Trade Company offers in its supermarkets a variety of foods and household goods that compares favorably with that in the stores of any small U. S. town. And prices are not much higher. Oranges, bananas, grapes and melons are plentiful in the first days after the arrival of the company's freighter.

An appliance store on Godthaab's main street displays a new-model TV set, although Greenland has no television except at U. S. bases in Sondre Stromfjord and Thule, far from the population centers. The latest recordings, the newest in European, American and Japanese photographic equipment and a wide array of hi-fi sets and components are available.

Lure of privilege. Danish technicians and civil servants, lured to Greenland by tax-free incomes, free housing and other inducements, say flats available to them in the newer apartment buildings are better than they can find in Copenhagen. Greenlanders, too, get new apartments, often with low rents.

Godthaab swarms with autos. There are 50 radio-dispatched taxis, two paved streets and an estimated total of 10 miles of usable roads. Small European cars are plentiful. There are some American autos, and an increasing number of Soviet-built compacts.

"The Russians make good cold-weather cars," a Danish resident explains.

No drivers' licenses have been required so far, but registration is to begin next year. Greenland's first traffic laws—a 40-mile-an-hour speed limit and a ban on standing up in trucks—took effect last July.

"What I like about this place," says a young Dane who now calls Godthaab home, "is that it hasn't any laws yet. It's like the old cow towns of the American West."

Problems familiar to the American West, where a primitive culture clashed with advancing civilization, are present.

"Greenland's problems are human ones," according to N. O. Christensen, a career Danish civil servant whose title of "Landshoevding" means "Governor."

"Remember," he adds, "we are not dealing with masses of people, only about 40,000. The problems are manageable."

The Governor is immensely proud of the progress that has been made on the island.

"If you had seen this country 20 years ago, when I first came here, you would realize what fantastic changes have taken place and how well the people are adjusting," he says.

The experiment of transforming Greenland into a modern community began in earnest little more than a decade ago.

Two centuries of missionary work and halfhearted colonization had done little to change Greenland. The natives clung to nomadic ways as they followed the seal. Early in the 1900s, the seal disappeared from Southwest Greenland and, at the same time, a warm climatic cycle brought the codfish into Davis Strait.

Now the emphasis is on fish. Foreign fleets from Norway, Portugal and France —some accompanied by factory ships— take rich hauls from the Greenland banks each summer.

Fish-filleting plants and freezing and salting plants have been built in nearly every Greenland town. There are two shrimp canneries. Exports of fish products, in 1964, for example, amounted to nearly 9 million dollars.

Boats in demand. Four large boats, with Danish crews training Greenlanders to man them, began fishing the banks of Davis Strait last year. Results have been good, and Greenlanders are now interested in buying bigger boats. A five-year construction program is under way to build three trawlers of 500 tons each, and 11 or 12 smaller ships.

More than 4,500 Greenlanders are engaged in fishing or work in the factories. There are 850 Greenlanders who own their own fishing boats.

Shoals of shrimp, among the world's largest, were discovered in Greenland waters in 1948. Now, in addition to the two canneries, four plants freeze shrimp for export.

Salmon that spawn in the waters of Norway, Scotland, Nova Scotia and Maine and then disappear, now are being caught in gill nets in Greenland fjords. A new freezing factory is going up in Frederikshaab to concentrate on salmon for European markets.

Another new industry is sheep farming, done only in the South in areas that Viking colonists farmed from the tenth to the fourteenth century. The lonely and isolated sheep farms in the sheltered valleys along the southern fjords produce 600 tons of frozen lamb annually and supply 36 tons of wool to Danish carpet factories.

Hanning Hoegh, a Greenlander from Julianehaab, is typical of the new breed of farmers. On an isolated site close to the 500-year-old ruins of a Norse settlement, he has built a 1,000-sheep farm in 12 years. On a five-acre plot, he grows oats that he must cut and stack for hay before the grain ripens. The season is too short for grain to mature. He feeds his sheep in a barn for two months, and lets them forage the rest of the time.

Greenland's rugged mountains are believed to hold vast mineral wealth, but, so far, little has been found.

"To pay," Governor Christensen points out, "a mineral deposit in Greenland has to be about twice as rich as anywhere else."

Cryolite, Greenland's one big mineral export, fits this formula. After 100 years of operation, the big cryolite mine at Ivigtut has been exhausted. At one time it provided almost the world's total supply of cryolite, a mineral additive used in refining aluminum. Greenland's cryolite still sells, however, and shipments from stockpiles at Ivigtut are continuing at a rate of about 3 million dollars' worth a year.

Mineral prospecting is encouraged under a relatively recent mining law that is modeled after Canadian law. Prospecting permits can be followed by search-and-discovery leases good for 12 years. Once a mine is established, a Danish-incorporated firm can get a production license for up to 50 years.

Thus fishing, farming and the search for mineral wealth promise to bring more and more change to Greenland. At the same time, the island is changing politically, as well.

Political integration. Greenland traded its colonial status for integration with Denmark in 1953. Two members of the Danish Parliament are now elected in Greenland. A 16-man provincial council, elected every four years, meets in Godthaab annually, and sometimes

more frequently. All members are Greenlanders.

Although Greenlanders have a strong sense of nationalism, officials say they are proud of their new political status. Issues at present involve such things as pay differentials and job preference, not national independence.

The pay issue is one on which Greenlanders have had a choice. A native of Greenland can earn only up to about 90 per cent of what a "sent-out person" from Denmark gets for the same work. The Greenland Council itself approved the formula, in return for keeping the island's tax-free status.

Greenland taxes liquor and tobacco heavily and imposes modest import duties on a few other items to finance welfare and road building. Otherwise, there are no taxes. Danish civil servants and private employes who stay two years in Greenland get a full rebate on Danish income taxes.

They also get free housing and annual vacations in Denmark with transportation paid for themselves and their families. Greenlanders and Danes living here get free medical and dental services. There is a growing network of well-equipped hospitals. Schools are free and schooling is compulsory. Ambitious Greenlanders can win fully paid scholarships for high schools and universities in Denmark.

Capital investment, subsidies and welfare support for Greenland take more than 100 million dollars a year out of Danish tax funds.

Little crime. Crime is not a serious problem here. The huge island's only jail is a six-cell institution in Godthaab. Prisons are unknown in the Eskimo tradition.

Offenders are sentenced to brief periods of exile to another community or are assigned to a period of work aboard a fishing boat or in a factory. Fines are sometimes imposed. Juvenile offenders are sent to stay with foster families for short terms.

The racial frictions that have plagued other countries during the process of transition away from colonialism have been missing, for the most part. There is considerable intermarriage among Danes and Greenlanders. And, according to the Governor, there is "no discrimination in Greenland."

A pretty Danish girl, working in Godthaab to gain experience and take advantage of a tax-free income, confirmed this vehemently during a conversation at a dancing party in the Godthaab community center. But then she said:

"I will dance with them, but I wouldn't marry one of them."

Her explanation:

"It's not discrimination. It's that our backgrounds are so different."

Helicopters give Greenlanders new mobility

THE "CHOPPERS" CHANGE GREENLAND

GODTHAAB, Greenland

The helicopter is playing a major role in the high-speed conversion of Greenland from backward colony to a place in the modern world.

Long, dark winters and polar storms isolate large areas of Greenland for half of every year. But now Greenlandair, the world's longest helicopter airline, is conquering isolation and bringing Greenlanders a new mobility.

In 1965, first year of its helicopter operations, Greenlandair carried 13,000 passengers—equal to one third of the total population in the area it serves.

This year, so far, passenger traffic is up 40 per cent.

The air age came slowly to Greenland. In all its 840,000 square miles there are only five airfields. Level sites are rare, and the cost of runways in the solid rock that forms most of the surface is prohibitive.

Instead, the major towns of the southwest coast now boast heliports —paved circles, 200 feet in diameter, built on heavy rock ballast.

Dog sled replaced. It is possible now to fly in a matter of hours from Jakobshavn, 200 miles north of the Arctic Circle, south to Julianehaab, near Greenland's southern tip.

Old Arctic hands find the idea hard to grasp. Before 1948 there were no regular coastal ship services. The towns of West Greenland were administered almost as separate colonies. Mail between northern and southern points often traveled by way of Copenhagen as the quickest route. In the long winter, most towns in the north could be reached only by dog sled.

Travelers now, in the comfortable, 24-passenger helicopters, make trips in hours that once took weeks.

Greenlanders are taking to the new method of travel.

Vlademar Lauritsen, a veteran pilot who has headed Greenlandair since its formation in 1960, believes the helicopters have proved themselves. In the first five months of operation, two helicopters hauled 10 per cent more passenger and cargo traffic than two flying boats the line used earlier had carried in the same period of the previous year.

—USN&WR Photos

World's longest helicopter airline carried 13,000 passengers in 1965—equal to one third of population.

Greenlandair is pioneering both in long-haul use of helicopters and in scheduled Arctic flying. Its "choppers" carry bigger loads over longer distances than any other helicopter airline.

Costly, but a lifeline. Maintenance is a special problem in Greenland. The giant gearboxes—heart of the helicopter's rotor system—must be overhauled after every 1,000 hours of use. They are flown to Los Angeles for the overhaul. Spare rotor blades and motors are kept on hand, and when these major parts need going over they, too, are sent to the United States.

All this makes Greenlandair a costly airline to operate. Also, the helicopters burn half a ton of fuel an hour and cost approximately $575 per hour while they are in the air.

But helicopters are providing Greenland with a lifeline it never had before. And now that the age of modern air travel has come to this remote land, the old hands say Greenland will never be the same. [END]

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A DOG TEAM on the Ross Ice Shelf with Mount Erebus in the background.

SILHOUETTE IN THE ANTARCTIC.—United States servicemen, silhouetted against the never-setting sun of the Antarctic, look at Vince's cross on Hut Point, only a few yards from the hut used by Captain Scott and his men during the winters of 1901 to 1904. This wooden cross was erected in memory of Able Seaman G. T. Vince, a member of Scott's expedition, who was drowned near Hut Point on March 11, 1902.

— United States Navy photograph